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ABSTRACT

This report and a motivation seminar were prepared for teachers in the Social Sciences Department at Champlain Regional College (Quebec) to study motivational dispositions of students who either avoided registering for a course in Quantitative Methods or failed out in important numbers. Teachers' consensus was that students in general seemed to lack self-regulatory mechanisms for academic achievement. A qualitative survey revealed that teaching students how to study and when to study would promote students' self-regulated academic achievement behaviors. The document is divided into five chapters: in Chapter 1, student cognitions are related to their motivations for studying; Chapter 2 focuses on motivational values and expectations, cognitions, metacognitions, and strategy management; Chapter 3 concentrates on teaching learning strategies to students; Chapter 4 examines teaching form and content and provides a detailed case study; and Chapter 5 presents a discussion, suggestions for future work, and conclusions. Appendixes provide an article entitled "The Danger of Success in Math" (Earl Babbie) and Seminar Presentation Transparency Masters. (Contains approximately 60 references.) (LL)

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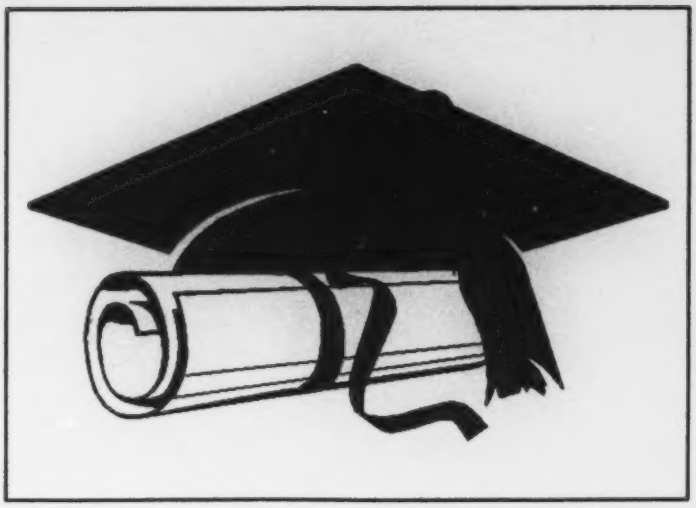

Self-Regulated Achievement in the Cégep Student: Motivated strategies for learning.

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Document Summary

This document and a motivation seminar were prepared to study the motivational dispositions of students who either avoided registering for a course in Quantitative Methods or failed out in important numbers. Teachers' consensus was that students in general seemed to lack self-regulatory mechanisms for academic achievement. The author was mandated to examine the professional literature, to prepare this report and a seminar on motivation for the teachers in the Social Sciences department of the College.

The results of this qualitative survey reveal that teaching students how to study and when to study promote students' self-regulated academic achievement behaviors. Teaching these learning strategies assumes: 1) teaching competence, 2) an intervention plan that avoids evaluations of learning strategies, especially for the ego-oriented type of student who is most often found to be in the low achieving group, and 3) instructing students in attributional retraining.

In Chapter 1 student cognitions are related to their motivations for studying. From the study of student cognitions emerge these facts: 1) Expectations are influenced by control and self-efficacy beliefs; 2) the feelings students attach to the beliefs they hold about their efforts and abilities influence their willingness to invest; 3) "math anxiety" appears to be a more common manifestation of the general problem students have about items 1 and 2; 4) that a vicious circle of negative self-reflections dominates a number of low achieving students who tend to focus more on how they feel (item 2) while more successful students focus on what went wrong and how they can learn from their mistakes (item 1). A solution is to teach course content (declarative knowledge), procedural knowledge (how to study), and conditional knowledge (when to study). The argument is advanced that teaching students a general strategy for learning is both possible and generalizable. The Comprehensive Model of General Strategy Use by Borkowski et al. is presented and applied to show how this is possible. Another section examines what strategies are and defends the need to teach students to use them. The final section reminds us that strategies are adjuncts for a competent teacher.

Chapter Two is based on the work by Pintrich et al. to examine how student values and expectations influence motivations; and, how these motives when combined with cognitions, metacognitions and strategy management provide the

basis for a realistic and working model of student self-regulation.

Chapter Three focuses on teaching learning strategies to students. It is argued that motivation is a process; how to identify the needs of students for learning strategies; how to teach both general and specific strategies to students; and, the emerging responsibility of teachers for doing so. A special section reviews the concerns for teaching Quantitative Methods.

While it is argued that teachers have the additional responsibility for teaching students general learning strategies, it doesn't appear that there is much help made available for them to do so. We are cautioned against teacher burnout because we hold teachers accountable when students fail but neglect to attribute much credit to them when students do well. Teachers are responsible for creating the conditions of learning, and now, the tools for learning. It remains that teaching should create a climate in which learning can and not necessarily will take place. Students are free to make choices as they see fit.

Chapter Four examines teaching form and content and provides a detailed case study. Chapter Five presents the discussion, suggestions for future work, and the conclusions. Working with low achieving students means teaching them, in a non-evaluative context, how and when to do their work, and how such change helps them re-think the role of their efforts.

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Chapter 1

Cognitions and Motivations

Learning in the typical college classroom, within an information processing model, requires students to collect, process and remember data. Self-regulated motivation in this context requires that students manifest abilities and a willingness to attend, receive and respond.The student expects his or her abilities and effort will produce the desired outcomes. One may already see the operation of cognitive and motivational factors which have been shown to be appropriate avenues for understanding self-regulated achievement behaviors in our Cégep[1] students.

Research driven results, based on a linear structural analysis, between cognition and motivation have shown:

> "...that motivational and cognitive components were positively correlated: that is, higher levels of motivation were associated with higher levels of cognitive engagement. Additionally, motivation and cognitive engagement were positively related to academic achievement. ... the relationship between motivation and cognition is not simply dynamic, but synergistic: the effect of the interaction between motivation and cognition is greater than their individual effects. The cooperative nature of the relationship between motivation and cognition is a crucial aspect of student learning (Garcia & Pintrich,1991; p.3)"

Such thinking is in keeping with work on our own Cégep student population.Talbot(1990) reports from a survey titled: "*Personality correlates and personal investment of college students who persist and achieve*" that:

> "...differences in student personality traits and cognitive structures are helpful in identifying those most likely to need help making it through college. The most influential personality traits in this regard appear to be

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[1]Cégep is an acronym for "Collège d'enseignement général et professionnel".

> intrinsic motivation and the student's level of cognitive categorization (attributional complexity). Students who perceive in terms of shades of grey rather than in black or white appear to make better use of their time and to rely more on feedback (p.57)."

Metacognitions, attributions and affect:

Student "abilities and willingness" point to the fact that there are cognitive strategies and affective processes operative, and an awareness in the student of their operation. This "awareness" dimension is referred to as *metacognitiveness*, or simply "executive processes that plan and direct learning (Pintrich and Johnson, 1990, p.87)". Our concern with cognitions, motivations and metacognitions is to help our teachers to understand how to support Cégep students in their efforts (cognitions) at self-regulated (metacognitions) academic achievement (motivations).

A special concern is the apparent inhibitions, fears, and crippling misperceptions some students manifest vis-à-vis certain disciplines and/or skills. For example, reading comprehension, writing essays and mathematical reasoning are most prone to negative attributional reflections ("I must not be that smart if I have to put in so much effort," and "I must be really stupid to have failed even after having worked that hard".) Such negative attributional reflections reveal "performance goal" oriented individuals

> ...where the focus is on the demonstration of high ability and avoidance of judgments of low ability, (who) are more likely to believe that effort and ability are inversely related with the subsequent inference that high effort signifies low ability. A performance goal orientation also seems to lead to more concern about the outcome with failure leading to attributions regarding the lack of ability (Pintrich and Garcia, 1991, p.372 describing the work of Dweck and Leggett,1988)

Carr, Borkowski and Maxwell (1991) in a study of the motivational components of underachievement report that:

> ...achievers associated their extant knowledge and skills with positive attributional beliefs about their performance of effort in determining performance. The failure of underachievers to develop an enriched,

> functional metacognitive system was ascribed, at least partially, to their negative attributional beliefs (Abstract). ...
>
> Inappropriate attributional beliefs impede the acquisition of strategic and metacognitive knowledge because children with external attributional orientations have little reason to learn or to use strategies that they feel will not help them achieve. From this perspective, dysfunctional attributional beliefs may alter the effectiveness of the entire metacognitive - motivational system, especially as it relates to acquiring, applying, and modifying strategies (Carr, Borkowski & Maxwell, 1991,p.115)

And, as these researchers suggest, which has been proven by Zimmerman and Martinez-Pons (1990) in their work with the gifted, "...more intelligent children learn about the importance of effort and become self-directed (p.115)"

Such negative attributional reflections are important but they are only a part of the model, as Carr et al. have suggested, in the quote of their abstract, that has emerged in efforts to understand self-regulated academic behaviors.

> Mager, a founder of the instructional objectives movement, asked: If students don't know where they are going, how will they know if they got there? We would like to add a corollary to this question: "If students don't care about where they are going, why should they care if they get there or not! (Weinstein, Hagen and Meyer, 1991; p.2)

Clearly then there are affective components to this model since students attach feelings to the beliefs they hold of their abilities and efforts. The willingness to learn, attributions about performance, and evaluation anxiety are the manifestations of this feeling dimension. Students prefer to use expressions like "usefulness," "interesting, and "value"" to refer to these feelings. However, these expressions are more in keeping with values for cognitive motivation. The negative attribution examples cited above reveal the gut-wrenching feelings such students experience when they expose themselves to measurements and evaluations of what they have learned. We have simply come to use the phrase "test anxiety" to describe such feelings.

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"Math anxiety":

We initially became interested in self-regulation precisely because students manifested "math anxiety" or some type of "test anxiety" in the Quantitative Methods ("QM") course. We realized quickly that our concerns about student non-performances have long been those of colleagues in the Math department. What is "math anxiety"? How does it compare with any other discipline-specific anxiety? How does it operate? What can be done to avoid or escape it?

Hadfield and Maddux (1988) have reported similar "mathematics anxiety" symptoms (i.e. "nervousness, frustration, discomfort") and have arrived at just about the same conclusions as we present here. That is, these authors have shown that "cognitive styles" and achievement levels interact in important ways. We have come to the conclusion, after summarily reviewing the literature on the topic of "math phobia" (a misnomer for math anxiety) that the problem has manifested itself in mathematics courses more often and thus drawn more attention[2]. However, it is by no means less important but just less prevalent in other courses -probably as a result of some relationship between levels of motivations, cognitions and metacognition styles, on the one hand and, of numerical reasoning and math skills required of students in many courses, on the other hand.

Students may have math anxieties because they have had prolonged exposures to, and an undue emphasis on, math being of "value" (i.e. they "feel" it more than "know" it) and, possibly, because they haven't acquired appropriate procedural and conditional knowledge related to math learning strategies. Although this interpretation is speculative, it does have some support in the literature:

> Students who have low perceptions of their math abilities and do not value mathematics may not report as much math anxiety as students who have low perceptions of their math abilities but think it is important to do well in mathematics (Meece,Wigfield and Eccles, 1990; p.61)

It isn't a surprise then, to read that:

> ...(I)t is students' interpretations of their achievement outcomes and not the

---

[2] See Paulos' (1989) "Innumeracy: Mathematical Illiteracy and Its Consequences" book.

> outcomes themselves that have the strongest effects on students' affective reactions to achievement (Ibidem,p.68)

Good and Brophy (1990), in reviewing the work of Anderson (1984) with elementary school children, reveal that strategy instruction is often missing.

> ...(T)eachers seldom discussed cognitive strategies for responding to the task when providing feedback, rather, their comments were usually procedural or focused on correctness of answers or neatness of work (p.401).

A similar case could be made for English language skills' anxieties. Many students complain and feel helpless about taking courses that emphasize writing skills. We only rarely hear about "English language skill" anxieties, or any other discipline specific anxiety, perhaps because fewer numbers of students react, or react with such intensity. There is nothing in the literature to suggest that processes for "math anxiety" are any different than "anxieties" that may develop for other disciplines. Our position is that anxieties for any discipline is person-generated. The "anxiety" is not inherent to the discipline, subject or topic but rather a manifestation from an individual about avoidance and escape conditioning. The following is a case in point.

An interesting explanation as to how students arrive at being "math anxious" has been offered, tongue-in-cheek, by none other than the research/math "guru" Earl Babbie. The integral text "The Danger of Success in Math" appears in Appendix 1. This text is important because it presents the concerns of all of us who have ever been confronted with teaching these topics or having to require students to work with these tools. As Babbie puts it:

> Here's the point of my report on Mathematical Marvin. As I've discussed Marvin with my students, it has become increasingly clear that most of them have formed a subconscious association between mathematical proficiency and Marvin's unenviable characteristics. Most have concluded that doing well in math and statistics would turn them into social misfits, and they have regarded that as too high a price to pay (p.437).

While Babbie suggests that strong peer rejection comes with the images of being "brainy" in math, he is probably more correct in hinting that strong (conscious and cognitive, not analytical and "subconscious") social conditioning processes operate

to help or interfere with the acquisition of learning strategies. The section on "Metacognitions", Chapter 2 (especially p.30), dealing with student self-disparagement and self-presentation, discusses such "conscious and cognitive" characteristics.

Irving Sarason has contributed much to the literature dealing with anxieties. The applications of his work with the great diversity of personnel in the American military serves us well. Sarason's work is not only research driven, supported by real-world applications, but quite similar to the diversity of our student population. Thus the results he reports appear to be quite generalizable. But before proceeding we need to make a distinction between "objective" and "subjective" anxiety. Students who panic or manifest symptoms of anxiety when they haven't completed the assigned reading, learned the materials, reviewed before the test etc. manifest "objective anxiety". The "subjectively anxious" students worry about their performances, when they have studied, and the impact poor performances will have or could have on themselves and their career, prospects for a job etc. This means telling the "objectively anxious" students that "tricks" and "shortcuts" such as reading the introduction, the first and last sentences of paragraphs, test-taking strategies etc. are acceptable review procedures but not sufficient for the serious work required to *acquire* the materials. What to do to help the "subjectively" anxious students is the basis of this discussion.

Subjectively anxious persons cannot focus on "task-relevant cognitions" instead of directing all their conscious energies to the task at hand. They readily admit to cognitions which they know are irrelevant. "The anxious person's negative self-appraisals are not only unpleasant but, because they are self-preoccupying, they detract from task concentration (Sarason,1987; p.132)". In this respect anxiety is related to too much emphasis on the "self" in learning.

> There is a sizeable body of evidence consistent with the idea that proneness to self-preoccupation, and more specifically worry over the evaluation, is a powerful component of what is referred to as text anxiety (Sarason, 1987; p.136)

One type of self-concept is called the "stream-of-consciousness" in which we are aware of ourselves as we monitor what we say and do. When we get so totally "absorbed" in what we do then we have removed ourselves to our limits from this stream-of-consciousness. Anxious students can't or won't remove themselves. Such

students are highly ego-oriented and appear not able to switch to a task orientation. It is quite easy to demonstrate in the laboratory the debilitating effects of an ego oriented (anxious) student. As Sarason summarizes: "...telling the subject that the task was a measure of intelligence (p.134)" will do it. As we have presented in the Pintrich and Garcia quote (first quote on page 5 of this document) and discussed in the section "Metacognitions, attributions and affect" (see page 6) anxious students have a "performance" rather than a "learning" orientation to learning. Their performances are expressions of their status, aspirations and, in general, reveal their beliefs about the considerable influences of extrinsic motives.

> Highly test-anxious individuals, more so than those with low and middle scores on test anxiety, are preoccupied with how poorly they are doing, how other people are faring, and what the examiner will think about them (Sarason, 1987;p.135)

> Previous research has shown that pre-performance instructions that downplay the evaluative aspects of tests reduce the cognitive interference by subjects high in test anxiety and increase their performance. However, this approach also creates one problem. Too benign a testing situation not only lowers anxiety but also lowers the motivation and performance of the low and middle test-anxiety scorers (Sarason, 1987; p.136)

Sarason suggests that both overt and covert modelling "...can shape and reshape one's views and expectancies concerning oneself and others (p.138)." The following quote is an elegant description, albeit technical, of the solution to helping test anxious students:

> Cognitive modelling might have considerable potential in instructional programs as a means of demonstrating for students the differences between adaptive and maladaptive cognitions and the negative aspects of maladaptive attentional habits (Sarason, 1987; p.138).

In effect the "negative attentional habits", which Sarason refers to, reflect students' negative self-attributions. We can and should deal with such mis-attributions through attributional re-training (learning to think about the task and not being self-preoccupied, and understanding that one's success is due to correct strategy use). This will be discussed later in the section "Strategies: What they are and how to teach students to use them."

In the sections that follow we address the issue that such attributional re-training, or reflecting on self-awareness, can lead to generalized results. That is, the student doesn't have to be "re-trained" for each test anxious condition since it is a state he carries with him into the test situation. Afterwards we argue that this training begins by having students re-examine their effort management in light of acquiring and developing strategies. Drawing students' attention and helping them to think and behave differently about this problem behavior is apparently sufficient.

> The results support an attentional interpretation of anxiety and worry and suggest that simply calling subjects' attention to the need for task-oriented behavior can have a salutary effect on their performance and intrusive thoughts (Sarason, 1987; p.139).

An important part of the problem with performance anxiety is that students invest substantial amounts of effort only to fail. Our open-door admissions' policy provides everyone opportunities for educational *development* and not necessarily for educational *achievement*. If we are to reduce learning and performance anxiety in this context then we must move from psychometrics to edumetrics. While both are based on sound, scientific principles, **psychometrics** emphasizes scores derived from educational *achievement* while **edumetrics** (Carver, 1974) reports on educational *change*. Since we are unlikely to re-orient our achievement oriented college system, it appears necessary for a compromise between achievement and changes in moving towards achievement goals.

Asking teachers to re-structure their teacher-made tests would perhaps make it possible to arrive at such a compromise. Examples are: if teachers had a 50%:30%:20% distribution of content (factual), applied (examples and the like) and interpretive (similarities, analogies etc.) type questions on their in-class objective tests; required students to write brief (two-,or three-sentence) "essay" answers to justify their answers to True-False, or Multiple Choice type questions; had students do two shorter assignments, the first of which is graded and provides detailed formative feedback about changes to be made in the second assignment, etc.

That such change is both desirable and necessary to help precompetent and undercompetent students has led to a relatively new field called "developmental education" (Weinstein, 1992). The concerns of developmental education are found in learning to learn courses which appear to have grown in popularity since the

idea was advanced in 1980 (See Pintrich, McKeachie and Lin, 1987). Perhaps, as we envision it for our college, this is a more realistic plan of intervention since all students would receive training in a learning to learn course. Thus, the students could be better prepared to face achievement type assessments. Additionally, no student could possibly avoid confronting change, as could be the case by selectively signing up for certain courses, since the learning to learn course would be required for all students enroling in the Social Science program. Thus a learning to learn course with a developmental education perspective seems warranted.

Reflective self-awareness and generalizability of learning to learn strategies:

We considered introducing a course, tentatively titled: "Introduction to Intellectual Skills and Habits for Doing College Work." Certainly we didn't want students to take such a course only as preparation for doing the Quantitative Methods course. We envisioned a more global goal in which many of the skills and habits students would acquire, or refresh, in such a course would find there way into other courses. After all, if students need a course on how to pass such-and-such a course then the problem is with the course and not with the students. We were, of course, at this point addressing the issues of learning strategies and generalizability of results.

But even within the recognition of the necessity to teach learning strategies, with an eye to generalizability, was the implicit theory that we needed to help students to turn inwards, to examine themselves. Can students become more self-regulated learners? Garcia and Pintrich (1991) have given this definition for "self-regulated learning":

> "...self-regulated learning as a set of learning strategies (monitoring, elaboration, and effort-management) that a student can use, allowing her to effectively approach a learning task (p.3)"

Or, as Weinstein,Hagen and Meyer (1991) have written: "The goal of the course is to help college students learn to help themselves academically...(p.2)" It would seem to be in the student's own best interest to jump at such opportunities. And, as we know, they don't. To understand why students don't take advantage of such resources placed at their disposition we need to understand how images of ones "self" operate in this context. Such understanding is critical to understanding the

development of learning orientation, how one approaches a task and task involvement, attributional processes that one uses to explain one's successes and failures to oneself etc.

Ridley (1991) has defined self-regulation as: "...thinking and acting in self-fulfilling ways in order to perpetuate and/or enhance one's image of self through time (p.1)" This definition emphasises those metacognitive processes in which students attach feelings to their beliefs and behaviors. Thus, while we may agree on the rather cognitive aspect, as in the definition cited above from Garcia and Pintrich (1991), it remains, as Ridley maintains that "Reliance on observed academic behaviors alone allows, at best, only inferences about self-regulation instead of direct study of this process (p.2)"

An analysis of Ridley's proposed model reveals that "reflectively intentional self-regulation" requires more than simple emotional responses and making choices (what he calls "first level responses"). Ridley states that such an individual

> ...reacts to the situation with unexamined and habitual thoughts, feelings, and behaviors limited to and defined primarily by the immediate externally-oriented conditions (p.3)

As for those at the level of intentional self-reflection Ridley continues,

> Initially perceived stimuli are reflectively evaluated and possibly compared with previous experiences. Initial judgments, beliefs, and goals are examined using higher-order self-processes which are volitionally and emotionally removed from the immediate external situation. This second-order second appraisal creates the possibility for a new and/or different interpretation of the event as well as a broader range of action alternatives appropriate to the situation (p.3)

The net result is the task- versus ego-orientations of students to learn.

> In other words, beliefs and emotions are accepted as the uncontrollable by-products of personal history and environmental stimuli. Initial unexamined perceptions of self and the external environment are accepted as "truth" and reality is not considered to be a question of self-choice. The lack of ...reflective awareness means that there is little chance for internally

> initiated change in one's self-conception and self-processes, thus, there is also little chance for self-directed change in one's perception of a given event. Under these circumstances, self-conception influences perception in cover and unpredictable ways and is vulnerable to external manipulation (Ridley, 1991; p.4)

Garcia and Pintrich (1991) have provided this linear equation model of the situation: "...perceptions of value, importance, and interest impact upon their ("students'") use of learning strategies and their evaluations of competence and expectancies for success (p.4)" A brief and critical examination by Pintrich and Johnson, (1990) argues convincingly for the case that such ways of thinking, as described by Ridley, are more related to learning strategies than to learning style. Learning styles, they argue, is assumed to be an innate personality trait while learning strategy suggests external and situational impacts on learning. In fact, Nolen (1988) has shown "task" orientation (how students approach and become involved in learning) leads to the "deeper" or "second levels" of processing Ridley wrote about. This supports a learning strategy approach to self-reflective awareness. That being the case, then they are skills which can be learned and, with some care, generalized.

Differing levels of ability, cognitive styles, student's knowledge of, and experience with strategy use, and, of course, differences in emotion/motivation are some of the limitations to generalizability which Brooks, Simutis and O'Neil (1985) have postulated. The most important one for the purposes of generalizability are ability levels. First, strategy instruction and attributional re-training is not suitable for all courses; second, strategy acquisition and development is related to the student's basic reading,writing and thinking skills; third, strategy acquisition needs to thread a fine line in motivation so that such extrinsic motivations don't undermine intrinsic motivations for learning; and, fourth, anxious students benefit the most from strategy instruction (McKeachie,Pintrich and Lin,1985). In a learning to learn course at The University of Michigan, tailored for at-risk students, some students still failed or did poorly. It is an unrealistic expectation at this time to expect to reach everyone with strategy instruction.

Generalizable strategy use is possible only if teachers require it and provide opportunities for transfer to other tasks and courses. So it is important that we be coherent and consistent in teaching learning strategies, correcting work according to these principles, and provide opportunities for their continued use.

Strategy instruction also requires students to be willing to engage in critical thinking about discrepancies in their strategies and ways of knowing. Teachers should motivate students to consider such information processing. Imposing it on students would be counter-productive since the work would likely generate evaluations which are incompatible with the negative self-attributions of ego-oriented students.

Teachers need to teach not only *what* but also *how* they know. We also recognize that teachers must want to teach learning strategies just as students must want to learn them. The "willingness to invest" must come from the student. The teacher should address this issue to the student at the first meeting. Getting students to comply to *reasonable* requests is the first step in strategy instruction. Students need to state and elaborate *realistic* responses. Teachers make sure that the proposed student actions are within their range of their abilities. It is in the student's mindful analysis of the situation[3] and elaborating plans, with the help of the teacher (rather than vice versa) that creates the abstractions necessary for students to become **self-**regulated learners.The teacher must first assess if the student's problem is related to learning. Otherwise students should be referred to appropriate professional services.

Goal orientation:

Pintrich and Garcia (1991) in a chapter titled: "Student Goal Orientation and Self-Regulation in the College Classroom" have clearly addressed the issue of strategy management for learning and offered some hope and practical pointers.

> ...highlights the importance of considering not just students' goals for their academic work, but also their strategies for doing the work. The problem of procedural knowledge, of "knowing how" to do an academic task, is as important to consider as the problem of "what motivates" students (p.399).

The problem, so far, according to some experts working with learning disabled students, is:

> ...most metacognitively based instructional packages have failed to produce

---

[3]See Langer (1982) for an excellent discussion on the topic of mindlessness or automatized strategies.

> dramatic and persistent gains because their designers have tacitly assumed that students automatically find pleasure in deploying effort and improving their skills (Borkowski et. al. 1992, p.2)

The critical question then becomes can we, as teachers and in addition to our responsibility to teach declarative knowledge (course contents), do something to encourage students? Not just encourage them to deploy efforts (which they are apparently doing) but to engage in thinking about the strategies they use.

Borkowski and Muthukrishna (1992), in their efforts to help exceptional children, have proposed a clear working model, see Figure 1 on page 21, at the heart of which tasks, strategy use, performance and feedback are related linearly. The outstanding contribution of this model is the understanding that feedback is a bi-directional path that inputs simultaneously into cognitive and affective "self-systems" (see paths numbered "1" and "2" in Figure 1 on page 21).

From our previous discussion on "metacognitions, attributions and affect" (see page 6) we know that the superior student who is interested in learning and performance engages in these bi-directional paths simultaneously. The performance oriented students, by focusing on ability and grades, engages in either Paths 1 or 2 depending on performance feedback. If he or she was successful then Path 2 is chosen. The message (from Block 7. "Metacognitive processes") is that whatever it is that he or she has been doing is working and so to continue doing it. So, this is not self-regulation but self-continuation. Students may not understand what they did to pass but that isn't important enough to pursue "Specific Strategy Knowledge" in Block 8.

If the student fails the performance is interpreted in terms of negative self-attributions and as threats to the attainment of his or her extrinsic motives and Path 1 is chosen. The student directly bypasses 1."Task" to go directly to 7." Metacognitive processes". He or she doesn't attribute importance to re-examining the task (path 4), the strategy they should have used, or used it better, and then try to redo the work to avoid making this mistake again.

Either in a success or failure condition such performance-oriented students tend not to see the importance of the self-regulation loop (i.e. path 4: 1."Task" to 7. "Metacognitive processes", to 2."Strategy use", to 3."Performance", to 4."Specific Strategy Knowledge", and then back to 2."Strategy use" -trying it once again to

see if it works well, i.e 3."Performance"- etc.) can have in learning to avoid this situation once again. What students do instead is go through paths 3A and 3B. They go to an ego-oriented metacognitive process (path 3A) that focuses on knowledge about self in terms of abilities and how results contribute to an extrinsic manifestation of possible selves (path 3B). At this step strategy instruction helps such students move from Block 5. "Self-Knowledge" to Block 8."Specific Strategy Knowledge" to help get into the self-regulation loop.

An example would be a student who knows that a couple of friends are coming over tonight for dinner. The performance oriented student would go to the local market and buy the meat and potatoes but forget to buy the mushrooms and gravy. He would feel terrible for having been so stupid as to do this. So, off to the local market once more for these items. On his way back he wonders if he hasn't forgotten something else. Now, he still feels a little stupid because he forgot the dessert. Back he goes. Now he goes home knowing that all is under control, in spite of the considerable effort that he had to put in. (Imagine what making dinner will be like!). When his friends arrive they brought the beer (which he just realizes he had forgotten). Imagine another student who sat down, thought out what would be needed, prepared a grocery list (and thought to check it out with someone who is "used" to having friends over for dinner), checked his personal finances and then gone to the local market.

Strategies: What they are and the need to teach students to use them:

Strategies are easy to teach and learn, and benefit all concerned. A strategy is based on one's awareness of the needs, dictated by a learning task, to outline, rehearse, summarize, paraphrase, integrate, synthesize, monitor and coordinate one's efforts with one's abilities to make effective use of time and resources placed at his or her disposition to acquire and act upon information. Thus, it is the metacognitive processes that monitor the synergistic efforts of cognition and motivation. The metacognitive processes and motivation are support strategies while effort and cognition have direct influences on strategies (Dansereau,1985).

Basically, one needs to learn about the strategies one uses (or misuses), to acquire and develop knowledge about those he needs, and to monitor and coordinate their use. A central question in learning strategies is whether one learns a general strategy framework and then fills it in with procedural knowledge related to the

course content, or does a student have to learn to develop distinct frameworks for each domain of knowledge? Students need to learn general strategy characteristics that Borkowski, Weyhing and Turner (1986) have identified as: Specific strategy knowledge, Metacognitive acquisition procedures, and General strategy knowledge. Such basic procedural knowledge is critical for teachers to help students become self-regulated learners. Students learn 1) how the use of an inappropriate strategy, or lack of knowledge about one, has produced undesirable efforts, 2) to go over the work that was not done correctly but this time using the strategy to show how it produces the desired results, 3) how the use of an appropriate strategy may be acquired and used to produce desired outcomes and, 3) not calling into doubt their ability but rather their misguided efforts. Table 1, on the next page, summarizes the elements of the general strategy framework.

Alexander and Judy (1988) have reviewed the work of both new and experienced learners to suggest that the latter recognize how strategies and learning, or task performance, interact. That is, a good strategy user realizes, above and beyond the existence of a generalized strategy, that his strategies must adapt to the learning and performance demands made of him. This support the position that students have to learn to develop distinct frameworks for each domain of knowledge. As we should expect, a student must first be taught about generalized strategy before trying to generalize it to other areas. At the critical level the student must come to realize the relationship between success and his awareness, development and use of strategies (attributional retraining).

> Attribution retraining involves modelling, socialization, and practice exercises designed to help students (a) to concentrate on doing the task at hand rather than to become distracted by fear of failure, (b) to cope with frustrations by retracing their steps to find their mistakes or by analyzing the problems to find other ways to approach them (rather than to give up), and (c) to attribute their failures to insufficient effort, lack of information, or reliance on ineffective strategies rather than to lack of ability (Good and Brophy, 1990; p.416)

In summary then, teachers' concerns with "student motivation" mean that they have to learn to motivate students to want and use strategies. There is every reason to believe that this change helps students to feel better about themselves which then transfers to their performances (Isen, Daubman, and Gorgoglione, 1987).

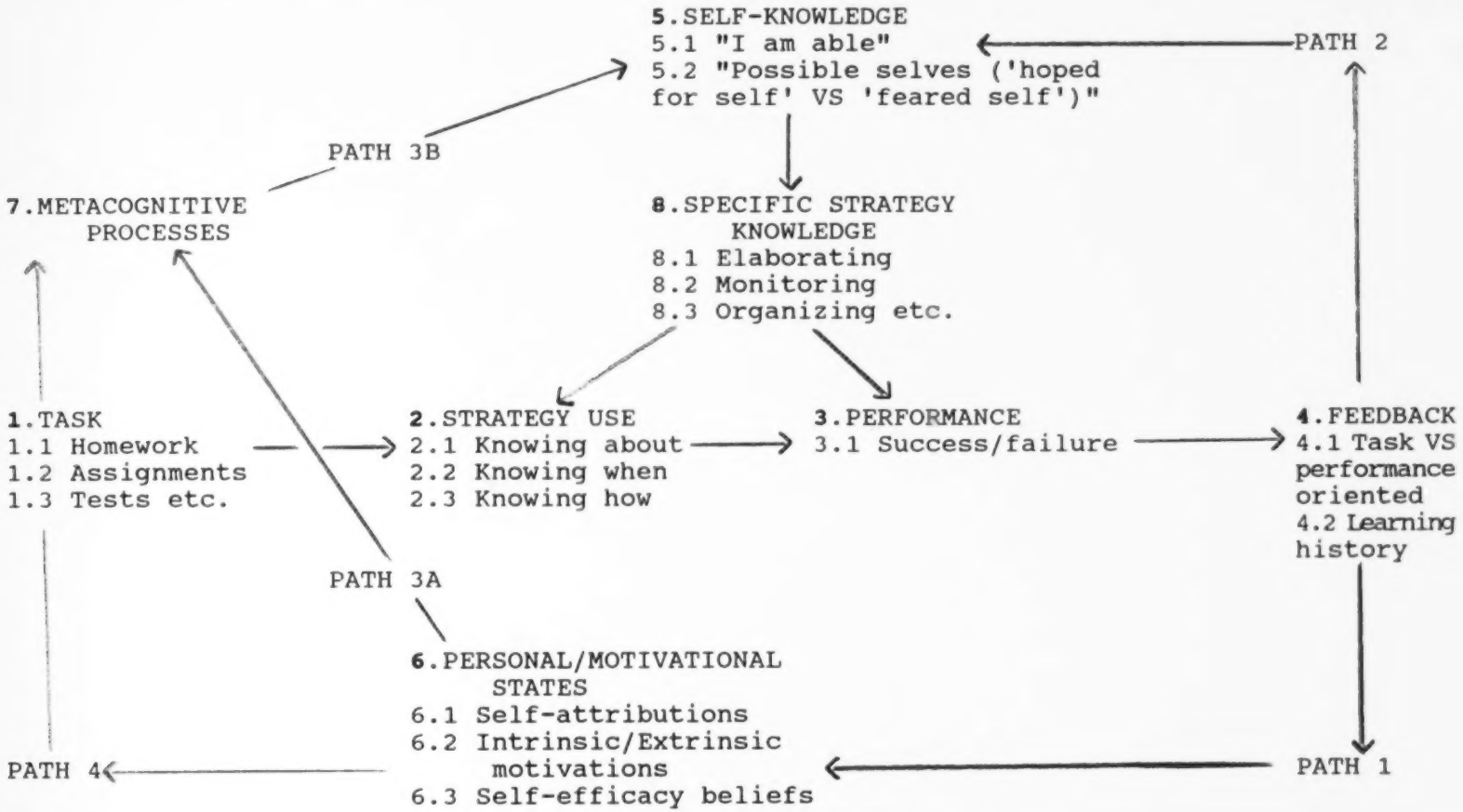
TABLE 1: **A Comprehensive Model of General Strategy Use.**(Abstracted from Borkowski, Weyhing and Turner, 1986; pp.131-132)

1.0 Specific strategy knowledge
- 1.1 Information input
- 1.2 Categorization based on understanding the organization
- 1.3 Implementing strategies requires working smarter not harder (Weinstein et al.1991)

2.0 Metacognitive acquisition procedures
- 2.1 Identifying and selecting appropriate strategy
- 2.2 Monitoring (acquisition & development of a strategy)
- 2.3 Coordinating strategies

3.0 General strategy knowledge
- 3.1 Beliefs about the use of strategies
- 3.2 Beliefs/attributions about the role of effort

FIGURE 1. Bidirectional paths for success- versus failure-oriented students. (Adapted from:"Motivational correlates and causes of strategy use," Borkowski and Muthukrishna,1992; pp.485-487)



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It may seem to tax teachers to call upon them to teach strategies. After all, not all research results need make their way into classroom activities. However, several important aspects of strategy instruction warrant this suggestion and the actual amount of time needed is probably no more than having to listen to students complain and bicker about grades. The students who need help with acquisition, development and use of strategies are generally those high on ego-orientations, or performance-orientations. That is, they are overly concerned with how their academic performances or non-performances will reflect upon them, and to the power they think significant others attribute to the grade (the extrinsic symbol) rather than to learning (the intrinsic motive). Thus, we need address ourselves only to those students who have not performed to criterion in our courses. This may mean anywhere from one to 10 students per course. We may wait to notice them as the course unfolds or actively seek them out, as described later in this paper. And, as we argue next, it may be more beneficial for at-risk students to actively seek them out.

Collectively addressing the weaker students or grouping them is a major problem. It appears that simply focusing on their lack of ability as a criterion for the composition of this group adversely affects their perception of the resources offered to them. Recall that they are very sensitive to reflections about their abilities -especially when they fail! A possible avenue is to confront them with their plight by drawing attention to their negative attributions (i.e."I musn't be that smart if I have to put in so much effort," and "I must be really stupid to have failed even after having worked that hard".) and the anxiety and anguish this causes in them. Offering help to avoid or escape unpleasant stimuli is a powerful motivator.

We could tell them that we should like to help them to remove misunderstandings (develop strategies) that will make it possible, right now and for this course, for them "to work better and not necessarily to be the best!" One needs to explain that "better" here means acquiring, developing and using strategies to make the most of their time and efforts because we can and usually do make mistakes. The alternative is to use the trial-and-error approach which is hardly a strategy. It is also preferable to tell them that we will show and involve them in seeing where they digressed and how knowledge and use of a strategy could have produced different results. Essentially the teacher avoids creating situations of evaluation and interpersonal competition. It is not by telling students what to do but by helping them think through each critical step, suggesting they consider alternative ways of

dealing with the problem at that step, and, in brief avoiding any suggestion that there is a strategy and a way to doing things.

At this point many teachers will argue that they have been coaching and providing detailed feedback on learning and study skills and habits. The critical difference to teaching strategies is that the student must review the process he or she used. The teacher notes all the incongruent steps and then asks the student to redo the work using the new knowledge. The process, apparently, needs to be done twice. Once for showing what was done and the other to show how it could have been done. *It is most important that all the while the teacher points out to the student, in this second and corrected review, that the student is able and that his or her efforts are producing the desired outcome.* It is in this process that teachers are doing "attributional re-training". There is every reason to believe that requesting students to think of outcomes in terms of efforts (Butler and Nisan, 1986; Grabe, 1985) rather than on ability and especially normative evaluations ("how others are doing it") (McColskey and Leary, 1985) will contribute to student intrinsic motivations for learning.

Since students are required to learn to make the connection between effort and outcomes it would seem more appropriate to refer to this process as contingency training. However, since the focus is on having the student discover and think about effective strategy development and use, it is more precise to refer to attributional re-training. As Borkowski et al. (1991) have observed: "It is this latter connection -the association between the learner's reasons for learning and the deployment of self-regulation- that has been absent from most instructional programs (pp.6-7).

> We believe that students' definitions of success (getting better versus being the best) and failure (making understandable mistakes versus being stupid) change under circumstances of task involvement, as do their attributions about the causes of success and failure (ability, effort, or appropriate strategy choice). (Borkowski, et al. 1992. p.2)
>
> ...(W)e should recognize that all learning strategies have intimate motivational correlates: high self-esteem, an internal locus of control, the tendency to attribute success to effort, strong beliefs about cognitive modifiability, and positive self-efficacy are among the consequences of a child's lengthy history of consistent, relatively successful strategy-governed

> habits of responding to learning problems, together with supportive feedback from parents and teachers. (Borkowski et al., 1992, p.5)

Borkowski et al, (1992) conclude in their review that relatively stable and generalized results are possible when attributional re-training is combined with strategy instruction. They maintain that:

> These results...led us to believe that long-term changes in the behavior of learning-impaired children are probably dependent on the development of complex relationships among components in specific strategy knowledge, self-regulation, and motivational beliefs. In a sense, this set of studies has "expanded the boundaries" of cognitively based interventions by focusing on how self-regulation, the heart of metacognition, depends on children's rationales and attitudes about the learning process per se and how they contribute to academic achievement (Borkowski et al. 1992; p.9).

Class contexts and teacher effectiveness:

We haven't addressed the specific issues of course contents and teacher effectiveness. There may be courses which, by their nature, call more upon one type of strategy than another. Just as there are differences in contents of say, Chemistry, History and English Composition, there are differences in the way they need to be taught. And, just as differences determined by disciplines exist so exist differences in ways of teaching and the strategies for learning. For example, Pintrich, De Groot and Garcia's (1992) work reveals teacher effectiveness to be more influential on college rather than high school students' cognitions and motivations. Pintrich (1988) has reviewed and summarized the work on these variables this way:

> ...different learning strategies may be differentially effective depending on the type of course (English, biology, or sociology) as well as the type of assignment or task involved in the course ...(p.77)

In addition to teaching declarative and procedural knowledge, teachers must now teach conditional knowledge. So, in the context of this project an "effective" teacher is one who is able to teach course contents ("declarative knowledge"), what strategies are and how to use them ("procedural knowledge") as well as when to use those strategies ("conditional knowledge)".

Chapter 2

Self Regulation: A Realistic and Working Model

Pintrich, Garcia and others are systematically investigating the effects of cognitions, motivations and metacognitions on academic performance. That is they are actively building a working model of self-regulation in college classrooms. Their work deserves our attention because it is an up-to-date research-driven model and, for our purposes, offers realistic, practical suggestions derived from, and demonstrated in, classroom-contexts (Pintrich,1989; Pintrich, de Groot & Garcia, 1992; Pintrich & Garcia, 1991; Pintrich and Schrauben, 1992). Borkowski and Muthukrishna (1992) have integrated the elements of their model, quite similar to those of Pintrich, Garcia and others, into a working model which helps us to understand and promote effective strategy teaching.

Since the purpose of this paper is to focus on practical considerations for the practitioners and teachers, a succinct summary of the variables in the model is found in Table 2 (page 31). This table summarizes the behaviors which teachers need to focus on while engaging students in the processes of attributional re-training and strategy acquisition and development.

The variables listed have been used to produce The Motivated Strategies for Learning Questionnaire (Pintrich et al. 1991) which is a self-report measure of students' behaviors in the areas of motivation, cognitions and self-management. The list of cognitive and metacognitive variables could be modified substantially to reflect some discipline specific needs as was suggested when we briefly treated the topic of "class contexts". This would not alter the validity since the additions can be accounted for by the model.

Motivations: Values

The fundamental difference in goal orientation is one between engaging in a task to develop a sense of competency, mastery or control and pursuing the task to do better than others, recognition, and involvement as a means to an end. The former has been referred to as task-oriented (intrinsically motivated) learning and the latter

as performance oriented or ego-oriented (extrinsically motivated) learning. Students who report high initial value for the course tend also to do better, to report feeling more efficacious, and more likely to attribute success to ability and failure to a lack of understanding or effort. In brief, the intrinsically motivated students report and use self-regulated learning. Reports tend to support that students intrinsically motivated, or intrinsically and extrinsically motivated do well. Students with low intrinsic and extrinsic motivation are not likely to care about education.

Motivations: Expectations

Expectations refer to the student's beliefs that certain actions, performed in given situations, at appropriate times, will yield the desired outcome. Students who believe that their actions can make a difference in what happens to them are manifesting an internal locus of control. The locus of control is intimately related to self-efficacy feelings and expectations.

A student registers in a course with different expectations based partly on what skills and abilities he expects to draw upon to "do well". The intrinsically motivated student expects to modify some strategies or even to have to learn a new one. For such students intelligence is not innately determined. However, for the extrinsically motivated students who focus on their abilities or lack of them, they operate on a "you've got it or you don't" attitude which adversely affects their expectations for success. Strategy instruction and attributional re-training focuses on helping them re-create a new learning history to break this circle of learned helplessness. First re-examine misunderstandings about the strategy that was needed to accomplish the task. Then re-apply the revised strategy to the problem (strategy instruction). Point-out to them that effort *when combined with appropriate knowledge about strategies* (attributional re-training), produces desired outcomes (both learning and better grades).

The students that we are particularly interested in are those low in intrinsic but high in extrinsic motivations. Grades "mean a lot" and they are willing to invest time to attain them. For them the usefulness, value and interest in the task is for the external manifestations that accompany achieving the goal (attention and admiration from parents, teachers, peers; better prospects for a job or further schooling etc.).

It is precisely the nature of the relationship of effort and performances that gives rise to anxiety. When such students notice that increased effort does not produce desired results they assume it means they lack ability. They often fail to see these results as the consequences of their trial-and-error learning strategies. It is at this point that strategy instruction and attributional re-training could shore up sagging self-esteem and foster beliefs of self-efficacy.

Cognitions:

Attention, coding, processing, repetition and other processes that take place in working (or short-term) memory are considered "cognitions". When rehearsal, elaboration, understanding and organization are used on materials held in short-term memory we move to a higher level of cognitions called long-term memory. It is in long-term memory that we find that students can make "connections" (integrate, assimilate, synthesize etc.) of what they have learned. Not, however, that it may be possible to hold materials in long-term memory through simple maintenance rehearsal (passive or rote repetition). We aim to have students perform elaborative rehearsal (finding meaning in what they are studying) so that they may draw upon it to make the generalizations and inferences that distinguish mastery oriented from the performance-oriented students.

The key cognitive skills required to pass from simple rehearsal to elaborative learning are: note-taking and review, summarizing and paraphrasing, and similarities and analogies. To encourage students to take lecture notes and to work on becoming better skilled means to insist on learning strategies. For example, good students review their notes as soon after class as possible to remove ambiguities, and especially to elaborate upon what they remember hearing but not having noted down.

Rehearsal, elaboration and organization are key concepts associated with cognitive management strategies. The ability to rehearse goes far beyond academia and is considered a life skill (Smith, 1982). The essential life skills like fundamental learning strategies require students to have recorded correctly who, what, where, when, why, and how. These skills represent the "deeper" levels of information processing. Students rehearse accurately (mastery learning) rather than "surface" or rote memorization which characterizes performance learning. As Lundeberg (1991) states: "Strategies are effortful; they usually do not make learning "easier", just more effective (p.2)".

"Deeper" levels of information processing, when combined with reflection, produce elaboration. It is this effortful elaboration which is the much sought out "meaningfulness". The accuracy and adequacy of class lecture notes, summaries of material read etc. is determined by the quality of the metacognitive processes that plan, monitor and regulate elaboration. Lundeberg (1991), with respect to PQ4R (an acronym for Preview, Question, Read, Reflect, Recite and Review; Thomas and Robinson, 1972), has shown that even this highly efficient and widespread learning strategy is no match for encouraging students to engage in active construction of meaning in what they are asked to learn. The ideal then is to teach students how to use a strategy. This tool helps them find "meaningfulness" in what they are doing. We now turn to metacognitions to understand how this happens.

Metacognitions:

Langer (1982) has provided a very readable account of mindless behavior, the symptoms of which adequately describe students who don't use strategies. She states:

> Technically speaking, mindlessness is a state of reduced cognitive activity in which a person responds to the environment without considering its potentially novel elements and instead relies on old distinctions rather than creating new categories. ... In mindlessness, people operate as if they were paying attention to the details of a given situation and weighing an appropriate response when in fact they are not (p.60).

The suggestion is advanced, in an example of building a home, as to how strategies are necessary for mindful behavior. However her work with Lois Imber reveals "...how practice can make imperfect (p.64)". We are creatures of habit looking to build routines precisely because they allow us to avoid thinking about what we are doing. Langer, in her expression "premature cognitive engagement," refers to the fact that some of us resort to this too quickly before we have had time to think about the information we need to process. This sounds similar to students who are looking for "tricks" to *perform* better.

According to Langer and Park (1990; pages 149-150) there are four major categories of personal incompetence each with its own history and consequences:

Precompetence "which is incompetence on its way to competence"; *undercompetence* which can be competence under mindful circumstances; *overcompetence* "which is competence 'in fact' but looks like incompetence in certain contexts"; and, *objective incompetence* in which "...someone may successfully arrive at the desired goal, but because of a disability, does not do so in the traditional way.

Our students will usually fit into precompetence or undercompetence. College teaching involves helping the precompetent and undercompetent student become competent. Precompetent and undercompetent students would definitely profit from strategy instruction. They are a very sizable group of students who thus would benefit from learning to work smarter and not harder. Overcompetent students probably have mastered the use of strategies in situation specific cases but fail to develop the more global awareness and/or understanding that strategies are constantly changing and re-forming to meet the needs dictated by the learning situation. It's like the flow of heavy traffic on our turnpikes. It appears as mayhem but the composition and flow of the traffic at any point is well orchestrated and purposeful (except for that occasional "Sunday driver" of course!). Objective incompetence would appear to refer to the fact that there may be subjects and assignments for which "traditional" methods fail us. So, it may be necessary for some of us, at a <u>few</u> stages of our college education, to try "to get by" with rote memorization and the like.

The alternative choice to deal with any type of incompetence is metacognitions, or the mindful planning, monitoring and self-regulation along with critical thinking. The choice between mindlessness and metacognitions, because it is a conscious and deliberate action, is probably related to one's needs, motives and values. We agree with the general idea referred to as "possible selves" in which students actively weigh the amount of effort that would be required for them to attain a higher level towards some ideal self-concept. For example, a student who has written a particularly poor essay may be asked to review his or mistakes while having it pointed out that by re-doing the paper, along the lines suggested, will show him or her that effort and strategy use will produce the next level towards being a "good student." However, some students reject this interference in their free choice. A student may see that the teacher's intervention is discriminatory (only the poorer students are being submitted to this "torture"), and requires much more effort than he or she is willing to invest.

Generally a student begins his work just as he has done in other courses or previous learning situations. If he has ability and has gotten by with cramming, if paraphrasing and plagiarism have worked, if teachers have accepted excuses for sloppy work etc. then the student is likely to repeat these strategies. It's only when the workload gets too demanding that the student realizes that he can't rely on his old strategies to cope with present academic demands. And, herein is the problem, students must choose to continue with old skills and strategies or acquire some new ones at the expense that the time they would have had to complete the work will have to be invested in acquiring a new learning behavior and strategy. A no win double avoidance situation that leads to failure or despair.

Self-disparagement, or "putting oneself down", expresses one's fear of failure. Students working under learning, performance or evaluation anxiety are aiming to protect themselves from the overwhelming effects of humiliation. By putting themselves down, not trying, or not putting in enough effort, they protect themselves from severe blows to their ego and glorify any achievements.

Self-presentation is a delicate balance of modesty in a Cégep student. Failure may make him look bad to the professor but success may make him look worse to his peers! Academic achievement for the student may lead to a false disclaimer, such as "Okay! I did well. But it's not anything big!" which alienates his peers because he appears condescending. Then again, unbridled academic achievement, such as "I don't need to worry. I've got all that material under control!" leads peers to think he's a braggart.

Self-disparagement and self-presentation are related to self- competency. If you say you "have it" and either you do or you don't "have it" then you are negatively evaluated as a braggart or ridiculized. If you say you don't "have it" and you don't "have it" then its too bad -you're not "smart". If you say you don't "have it" and you do "have it" then you get approval. Thus, it is better to be modest in self-presentation. The problem arises in that the degree of modesty is a function of the role. When with a teacher the student has little interest in being modest about ability and effort, yet when with his peers he has every interest to be much more modest in ability and especially in effort so as not to appear obnoxious. These behaviors are special types of learning and performance anxieties.

TABLE 2: **Variables of the Motivated Strategies for Learning.** (Abstracted from Pintrich and Johnson, 1990; pp.87-88)

1. Motivation
    - 1.1 Values
        - 1.11 Goal orientation
        - 1.12 External reward focus
        - 1.13 Task value
            1) usefulness
            2) value
            3) interest
    - 1.2 Expectations
        - 1.21 Control beliefs
            1) for learning
            2) for using strategies to learn
        - 1.22 Self-efficacy beliefs
            1) self-confidence to learn
            2) self-confidence to master (and perform)
        - 1.23 Affect
            1) learning anxiety
            2) performance anxiety
            3) evaluation anxiety

2. Cognitions and Metacognitions
    - 2.1 Cognitive
        - 2.11 Rehearsal
            1) recalling
            2) repeating
            3) recognizing
        - 2.12 Elaboration
            1) summarizing
            2) paraphrasing
        - 2.13 Organization
            1) outlining
            2) integrating
            3) synthesizing
    - 2.2 Metacognitive
        - 2.21 Planning
        - 2.22 Monitoring
        - 2.23 Regulating
        - 2.24 Critical thinking
    - 2.3 Strategy Management
        - 2.31 Use of time
        - 2.32 Study environment
        - 2.33 Effort management
        - 2.34 Help-seeking behaviors

Clearly, the academic situation needs to be re-examined to reduce or eliminate learning, performance and evaluation anxieties as well as to restore consistency between the meanings these terms have for the student vis-à-vis his peers and vis-à-vis his teachers. The problem appears to be that expectations for effort seem to vary as a function of the social role. Learning anxiety for the student, vis-à-vis the teacher, means the material, topics or even the discipline are anxiogenic. Learning anxiety for the student vis-à-vis another student means peer approval and acceptance. Effort management and self-efficacy may be related to students actions, situations and outcomes they expect as a function of which role they are playing - student-to-student, or student-to-teacher.

Thus, we shouldn't expect that introducing change, strategy management and attributional re-training per se, will produce increases in academic achievement. If these work at all they will have to do so through the changes produced in the student's academic self-concept. That's quite a challenge to teachers. What we may be expected to do, given the realistic constraints imposed by our training, experience and our own personality, is to offer students help without singling out the ego-oriented students or creating evaluation contexts in which the help is promulgated. Teaching students about strategies, how and when to use them fits this bill.

How many of teachers have heard students tell them that the course is "only complimentary", or "not required", or "an overload"? Some students need only two courses to complete their program of studies but sign up for four since the system pays for a minimum of four courses for which someone registers and bills them tuition for taking 3 or less courses. Thus, the student may not want "help". *We can motivate change but I do not believe we can motivate students.* That goal is much too unstable and broad for teachers to focus on.

Strategy management:

The process of change is by its nature anxiety producing in ego-oriented students. It's as though they hear that what they are, or what they have been doing is somehow inappropriate or inadequate. They don't have the reflex, that performance-oriented students seem to have, to think that they misunderstood some part of the problem or their strategy to deal with the problem.

What we can do to help ego-oriented students is to introduce change without threatening their abilities (e.g "You have the skills. It's probably that some misunderstanding has arisen about the assignment or doing it. The time you will need to revise your work decreases as your efforts coordinate what you have to do with how and when you have to do it. In this way you are encouraged to pursue this behavior until you attain a higher grade level."). Once this door is open students can be motivated to examine and make necessary adjustments to their use of time and study environments. To get students to participate in examining the time, place, effort and resources they use requires teachers to ask open-ended questions (questions that cannot be answered by "yes" or "no" or the like) in a non-evaluative context. From there the work of the counsellors and other support staff can progress.

Chapter 3

Teaching Learning Strategies to Students

The focus of this paper is on motivating students. Dealing with their lack of interest, failure to take opportune risks, an unwillingness to invest and, in general, their lack of self-regulated academic achievement behaviors. Before we address these issues we need to consider the teachers in this process. What are the sources of motivations, and especially the keenful insights, to reassure teachers that, as each wave of "new" suggestions comes to them, that *their efforts* will produce desired outcomes for *students and themselves*? That is, we hold teachers accountable for teaching learning strategies to students, but what do we do to help them achieve this goal?

The literature on attributions, in relation to student academic achievement, reveals that parents, administrators, and students point to successful students and admire their talent and abilities. And when students failed, under similar learning conditions, all groups concerned were quick to hold teachers accountable for the failures! It doesn't sound realistic that teachers should be excluded from explanations for success and singled out as explanations for student failures. A recent DIALOG search on finding ways to motivate teachers to motivate students resulted in opinion papers, target groups (handicapped, gender) and a pot pourri of literature. None even suggests how to introduce change to teachers. Many times when administrators, and sometimes teachers, get some document or other that appeals to his or her views of education, motivation etc., or comes back "hyped up" from a conference, then we find "suggestions" in our mailboxes. The message is clear: we are the agents of change! Where are the resources?

What we fail to understand is that teachers and students react the same way to requests for "change". It's as though what teachers do, or how they do it, or when they do it etc. isn't acceptable or appropriate. Teachers need to be involved in the change process to avoid stress and to ensure success. To that extent teachers have been fortunate in our Cégep. This department and College, by the mission statement, and the desire to maintain a small campus with much interaction between all groups (administrators, support staff, teachers and students) ensure the

means for these consultations to occur. Asking teachers to teach students learning strategies requires the same strategies and motivations as when teachers require students to change through learning. Students and teachers must operate with similar processes, strategies for intervening, and goals to be effective. Otherwise students learn to rely on "shortcuts," "cramming," "testwiseness" etc. just as teachers learn to "deliver" unprepared lectures, copy tests straight out of Instructor's Manuals and, in general, rely on their own set of "shortcuts".

This chapter begins by establishing a guiding principle: motivation is a process and not an end-state. We then review Good and Brophy's "Guidelines for Motivating Students," (1990), while refreshing ourselves on ways of motivating ourselves to motivate students. The focus then turns to specific and very practical ways of teaching learning strategies including "Teaching tips" from seasoned teachers and researchers on this very issue.

The process of motivated learning:

Pintrich (1988b), one of the rare persons to focus on college students and their needs, presents "...four aspects of student learning that are relevant to teaching and learning in postsecondary settings: student knowledge, learning strategies, critical thinking and problem solving, and motivation (p.66)". We attach the aspect of *student knowledge* to student inherent abilities, antecedent training and experiences, and to the expertise of the teacher who defines the content domain. The facets of the student knowledge aspect are addressed in teacher training and by individual preparation. The *critical thinking and problem solving* aspect will be addressed by our colleague Jan Warnke in a seminar later this term. That leaves us with the two central aspects: *learning strategies* and *student motivation* for learning.

The information processing model we have espoused in this paper, combined with cognitive psychology, places the emphasis on the hyphen between teacher-learner interactions. Those mental processes which behaviorists rejected as having little or no meaning, since they couldn't be studied directly, have come to the forefront with new and adequate ways of inferring mental processes that operate while the transition occurs from the teacher to the student. As Weinstein and Mayer (1986) put it: "...techniques that a learner can be taught to use during learning (p.315)". What is particularly interesting in the work of Weinstein and Mayer is their perception of the *goal* of learning strategies:

> Thus, the goal of any particular learning strategy may be to affect the learner's motivational or affective state, or the way in which the learner selects, acquires, organizes, or integrates new knowledge (p.315).

We expected to see "selection, acquisition, organization and integration" in the definition of "learning strategy". However, that we should learn, right away in the first part of the definition, that teachers can use learning strategies to "motivate students" is a major change in the thinking about teacher training and preparation. Given the rapid changes in technology, including educational technology, students are confronted with having to process a great deal of information about complex issues.

Just imagine how relatively "easy" it was to learn to type and that, now, many of us require students to produce their work using computerized word processors. Granted that the use of the word processor greatly facilitates the tasks (especially those grammar and spelling checkers!) it remains that the manuals that explain their operation are not always easily assimilated. Many parallel publishing houses have made a killing in this market by producing manuals which have combined what to do with when and how to do it (learning strategies). Incidentally, much of the work environment of personal computers describe this learning strategy environment as "user friendly"!

Teachers have probably come into, and made a career of, teaching because they manifested both the cognitive skills and the interest/value for what they know. It must be quite disheartening for them to know and feel that students casually dismiss the potential that each their disciplines can and does contribute to students' lives. When we reflect on the critical events that have shaped teachers' choices to become teachers it is not unusual to find anecdotes of "model" teachers who "helped". When the nature of this help is examined what we find are the cognitive and affective motivations which were often combined with ways these model teachers went about acquiring their skills for working with knowledge and people. That is, model teachers also taught their students how to acquire or want to acquire the knowledge.

Teaching is not the stereotypical situation of standing before students in a class and simply presenting materials. We have lectures or "discourse" for that. And, as Webster's dictionary tells us, this is no more than "...the capacity of orderly thought or procedure." When we reach college level we attend lectures which

means we should have developed cognitive skills to process, over relatively long periods of time, complex verbal material. How do we attain these levels of skills? Of course we learn them but where and when? It seems unfortunate that teachers emphasize the inherent value of their materials but fail to teach students the means for processing it.

Just think of how people don't like to feel inadequate or inappropriate even in the simplest of situations, like ordering from the menu in an Italian restaurant. Restaurant menus have conveniently placed the pronunciation of the foreign phrase or word in parentheses next to the word(s). More complex situations in the classroom exist. Given what we have presented about ego-oriented students (the ones most likely to feel inappropriate or inadequate in our classes) then teachers should, indeed must, do something to help them. So, if teachers wish to succeed in transmitting their knowledge they must actively involve students. The process for doing so is called teaching students learning strategies.

The acquisition of such skills promotes "deeper" rather than "surface" learning which in turn translates into better retention, understanding and finally, at the end, into academic achievement. Implicit to this discussion is the fact that teaching and learning strategies will help students attain their potential sooner. Whether that level of attainment corresponds to minimal achievement standards remains to be shown.

Each of us has particular difficulties because some material is laden with terminology and theory, complex processes and issues etc. Some students "...may do very well on examinations covering lecture material, while another type of student does very well on the laboratory exercises (Pintrich,1988b; p.72)" etc. We cannot reach all students all the time. So, it may be that strategy instruction has been tried or is being tried without much success. Perhaps in moving from general strategy instruction to discipline (and highly specific) strategy instruction some students lack the basic skills or have reached the limits of their ability. An open door admissions' policy guarantees everyone a fair chance at an education, and not a promise to be educated beyond his or her potential!

Identifying the needs of students for learning strategies:

Many teachers and students complain that by the time they know students are in academic difficulty it is almost too late to intervene. Although the Motivated Learning Strategies Questionnaire (Pintrich et al., 1991) is a valid and reliable means for the early assessment and identifying of students who could have academic difficulty, it remains that a quicker and easier means of estimating potential difficulties is available. First, an in-class questionnaire takes up much valuable time. Then there is the time to score it, complete student feedback sheets, and then return formative feedback to students (more valuable time). What appears essential to us,and as Pintrich (1988b) states, is:

> At the level of the individual student, we have found that providing individual feedback about use of learning strategies motivates thinking about skills in a new way. Students discover that these strategies are learnable skills and that academic performance is not totally determined by general ability or intelligence (p.72).

This is an eloquent statement to motivate students to work to attain their potential. At this conjecture we attain student self-regulated academic achievement motivation. We recommend to begin with several "Teaching Tips". Then as teachers adapt they may want to see just how many other "at-risk" students are left. If the numbers warrant it then they can re-examine, within the Department, with the Academic Dean and Counselling Services, the use of the Motivated Learning Strategies Questionnaire. For example, if teachers decide to go ahead with a course dealing with teaching students work habits and intellectual skills necessary to do college work then we may want to use the MSLQ in those courses.

You have received a copy of the **Teaching Tips for Users of the Motivated Strategies for Learning Questionnaire** (Johnson et al., 1991). The companion **Classroom Assessment Techniques** (Cross and Angelo,1988) has been placed in the Resource Center for you to consult. These two references are meant to accompany the MSLQ. They contain enough detailed, practical and creative "Tips" for teachers to find not only suggestions as to what to do but also when and why to do it. They are the very rare resources teachers need to motivate themselves and their students towards changes in teaching and learning strategies.

For example, (Johnson et al., 1991; p.7)

> TIP 1: Identify the students' goals for learning.
>
> HOW:
> 1. Ask students to write their own goals for the course.
> 2. Have students read the goals listed in the course syllabus, then ask them to rank the goals according to the importance of each goal to them personally.
> 3. Next, ask the students to estimate how difficult each goal will be to achieve (e.g., using a scale from "Very difficult" to "Easy"). For a more extended discussion of this tip, see Cross and Angelo (1988) Classroom Assessment Technique 15.
>
> WHY?
> The instructor can identify how closely the learning goals of the students correspond to the learning goals for the course and plan strategies for developing greater motivation for learning.

Such information provides teachers with motivation and strategies for teaching students learning strategies. We are given the means in the "How" sections and provided with the motivation that these tap into in the "Why" section. And, as you can see in item 3. there is a cross-reference for those who should like to pursue this TIP further. TIP's are given at a general level of strategy so that they may be independent of disciplines. However, the clear directives as to what to do and what to expect make it possible to adapt the materials to most any course.

The MSLQ is currently being validated for our Cégep population. A special concern is determining how the Ego-oriented (or the student that most needs to learn strategies) responds as the consumer of our "teaching tips". The literature has been quite clear that singling out students, especially these at-risk students, for any special consideration, is counter-productive. The suggestion made by Good and Brophy (1990) is:

> Teachers can reduce the sometimes debilitating effect of concentrated special attention to low achievers by maintaining periodic individual contact with all students (p.449).

This poses no special problems for us given the generous amounts of office time each of us places at the students' disposal. We need only remind teachers to minimize evaluations and to emphasize mastery by effort management.

Teaching learning strategies:

Our first concern is with how we present these needs for learning strategies to students. The process of direct explanation requires us to present:

(1) what the strategy is;
(2) why a strategy should be learned;
(3) how to use the strategy;
(4) when and where the strategy is to be used; and,
(5) how to evaluate use of the strategy (Winograd and Hare, 1988).

To better understand the teacher's role and the purpose of direct explanation of teaching students to learn strategies, it is necessary to apply the materials in Tables 1 and 2 (**A Comprehensive Model of General Strategy Use**, and **Variables of the Motivated Strategies for Learning**, pages 20 and 31, respectively). But before we proceed we should like to summarize information abstracted from a major Educational Psychology textbook (Good and Brophy, 1990; p.411):

1. Avoid embarrassing or criticizing students.

2. Plan work to call upon moderate student effort.

3. Try to relate the topics to some current event or something relevant to the students' lives.

4. Remember that students will follow as they are led. Expect success and you will be more than likely to get it.

5. Offer praise, attention and help when the student is showing some signs of being interested in his or her own success.

6. Avoid competition with others. Get rid of those anecdotes that remind students just how "awful" it will be in university, or that they have to be the "best".

7. Whenever possible plan projects, labs, field trips etc. that allow some students an element of choice. Novelty and variety won't hurt either.

8. Try to provide work that the student will be able to bring to its logical conclusion. Then plan and provide immediate feedback.

9. You have to believe in your discipline and your topic. Project an image of competence, concern and professional curiosity.

10. If at all possible summarize the lecture at the end of class, offer some previews for the next one, and begin a class by resuming what you have seen so far. Repetition is effective, and in this context, it isn't patently offensive.

Teaching the comprehensive model of general strategy use:

Under "Specific strategy knowledge" teachers need to demonstrate to students those skills and work habits that will facilitate the acquisition of information. For many courses this means that the sooner the student is able to acquire a working vocabulary in the discipline, the easier it will be for him or her to attend to lectures, read more materials, comprehend and thus retain more (because of the "deeper" levels of information processing, i.e. they are actively involved) and finally do better or at least perform in accordance with levels of effort expenditure.

Since many students are one their own for the first time I like to give them this example.

If a student were to prepare dinner by going out to get the steak, let's say. Then return home only to find he doesn't have any potatoes. Back to the corner variety store to get potatoes. Then he thinks while in the store, because now he realizes, he may have forgotten something else. He also is at a lost because he can't visualize or remember what exactly is left in the cupboards. How he wishes he had thought of this before he left the apartment for returning to get the potatoes. Actually, he would have been better off to plan his menu, look around to see what he had, perhaps check out his budget to avoid another unpleasant surprise, and then make out a shopping list. Also, if the budget isn't too healthy and he still has a "steak"

> appetite he may want to plan ahead to see what the "weekly specials" are in nearby stores. Preparing a comprehensive and general strategy for doing your grocery shopping means you are working smarter not harder.
>
> Now, could you tell me how we might plan a comprehensive and general learning strategy for this course?

While I ask this question I point to the detailed course outline and say: "Hint!"

With a little help students get around to identifying: What do you have to do? When do you have to do it? How much of your grade is attached to it? What kinds of skills do I have for doing each of these tasks?

We then examine what it means using present skills to plan to get through the work "If you are a 'slow' reader, doesn't it mean that you will have to set up and keep a reading schedule?", I ask. "Perhaps leaving room for a day or two off, to reward yourself for having kept up with your work, or if need be to catch up with an unavoidable event that delayed the reading for a given day." At this point students understand.

Also, I tell them, that this is the sort of advice they can expect from me during office visits. I will try to tailor my responses and suggestions for their particular needs, but that means that both of us have to agree to be working together so that no one is burdened by the work.

I usually like to suggest something about the "Ego-Orientation" (page 14) and attributional retraining without specifically identifying them as such.

> While all this activity about general strategy use is taking place we are also thinking about it and the possible effects it will have. This thinking about how we think and feel is "metacognitions". You can either think about the task, identify, monitor, develop and coordinate strategies, as in our preceding example or you can think about how bad you will feel if you fail to try or simply "fail" . For those of you to whom this "feeling bad" seems painfully realistic I ask you: "What have you got to lose?" Take my advice, try something "on the wild side" (I try to fit in some current jargon from the music scene to keep their attention).

Of course this example is highly personalized. However, teachers will find in it all the essential ingredients proposed by Borkowski et al. (1986; Table 1, p.20).

Presenting discipline specific variables of the motivated strategies for learning:

Several issues must be touched upon rapidly during the first few courses: Values and expectations as motivators, the cognitive and metacognitive processes, and variables that will be the ingredients for a motivated strategy for learning.

The usefulness, value and the interest for a course is directly related to the skills with which students can process the information presented. Additionally, acquiring or developing a general strategy for learning, even if students can't see much interest or use for the information at the time, is a tool which they can learn here and then use, hopefully more easily and more quickly, in other courses or situations. So, even if learning content doesn't seem important at the beginning of the semester, the parallel program of learning to learn ought to be an intellectual skill that all persons have an interest in acquiring. After all, the information explosion places heavy demands on people to be able to read and/or listen to learn efficiently.

Under the cognitive skills we like to refer students to the general procedures for taking lecture notes, revising ,elaborating and organizing them. We invite students to consult with the Counsellor to talk about these skills, to talk to their teachers or to consult any of the variety of resources on the topic in the Library. The issue, we maintain is with metacognitive activity. Students must learn to plan, monitor, regulate and evaluate their use of time, study environment, efforts, and their help-seeking behaviors.

At this point teachers need to identify some of the specific variables that may help students acquire information. For example, we explain using the PQ4R method, the conditions under which to read materials, and how to use the course outline to plan work. In doing so students usually come by for an office visit to discuss some facet of the work and/or their skills to do it.

Specific concerns for teaching mathematics in general and Quantitative Methods in particular:

A specific mandate of this seminar was to address the problems faced by teachers and students in QM and IM. Good and Brophy (1990) provide this excellent statement for teaching students to think differently about math and to encourage them to develop and use strategies:

> Difficulty in learning mathematics does not necessarily imply difficulty in learning other subject-matter areas, and even within mathematics, difficulty in learning to graph coordinates does not necessarily mean difficulty in learning to solve differential equations or understand geometric relationships. Even within a problem area (such as graphic coordinates), knowledge and skills can be built up gradually through mastery of each successive step toward the ultimate objectives, if the student persists in putting forth reasonable effort, accepts teacher help, and does not lose patience or give up whenever success is not achieved easily (p.416).

Such information appears relevant to students, is easily presented by the teacher, and is realistic. Such an explanation forces the teacher and the student to dissect the situation into problem-steps, identify each skill to be acquired and then to chain these skills together. Thinking up these descriptions, delivering them, using them with students, and evaluating progress places the emphasis on the acquisition of skills and training rather than on grades and diplomas.

The teacher's responsibility to teach students strategies for learning:

The larger Cégeps in the network have "Aide Pédagogique Individuel" or "API's" whose responsibilities, strangely enough, resemble what we have discussed here. Several possibilities exist to explain why, in spite of the API's efforts, there are still relatively high failure and abandon rates.

It may be that these APIs are not intervening appropriately with the at risk group. Students may voluntarily seek out their help or be referred to them by others, especially teachers. As we have argued there may be a higher proportion of "ego-oriented" students amongst those who are referred to the APIs. And, as we have discussed the literature suggests that the manner in which teachers and others

intervene may actually increase negative self-attributions. These biased attribution processes have been shown to be at the heart of the problem of self-regulatory academic achievement problems. So,by the time they get to the API some students are too defensive to be helped.

APIs may also ignore that attributional re-training is the focal point for helping students help themselves. Getting students to actively participate in their motivational processes, through the development and acquisition of learning strategies, in their motivational process is a necessary pre-requisite to changing faulty attributional processes. Planning for the student and involving the student in making the plan have different impacts on students. Changes in behavior are increased with active involvement.

It may also be possible that the role of the teacher in this intervention strategy has been overlooked. Students with faulty attributional processes have an important problem with seeing the relationship between effort, guided by strategy development and acquisition, and their performances. It may be, in parallel, that such students may have problems perceiving how persons other than the teacher could help them since, in their experience, convincing the teacher seems an important part of their personal attributional belief. Working through a third party may place too much emphasis on the student's abilities and efforts which only serves to reinforce his or her faulty implicit theory of intelligence (i.e. "You've got it, or you don't!").

Our graduates have characterized this College by the accessibility and cooperative attitude of the teachers. Perhaps teachers in this college are the ones best suited, because of student beliefs about intervention strategies and their effectiveness, to tend students a helping hand.

It may be that the combination of the following characteristics explains this interpretation. Expert sources, especially McCombs (1988) have shown that:

1. the combination of effective communication and a problem-solving orientation;

2. a friendly student-oriented approach with a flexible format of instruction based on student needs and the rate at which they can process information, along with examples as to how learning this content material can benefit

someone; and,

3. explaining to students how you, as a teacher, monitor your own work to know that you are "getting the point across", that the tests are doing their job etc.

This is the parallel learning strategy process teachers must use on themselves if they are to model the learning strategies they wish students to acquire. Teachers who assign books and then fail to systematically refer to them are undermining the motivation to read. Since many Social Science courses required "much" reading -by student standards- we would do well to consider how we might encourage or incite students to read. Since this topic is beyond the scope of this essay, I wish to leave you with the title of an article that is very revealing: "Implicit Instruction of Strategies for Learning from Text" (Schallert, Alexander and Goetz, 1988). The added emphasis to the word "implicit" is made to point out that teaching this particular learning strategy doesn't require the formal presentation as in the example of student difficulties with math (see the Good and Brophy, 1990; p.416 quote on page 45). We don't always have to be very formal nor do we always have to use up precious class time to teach learning strategies.

We agree with Weinstein and Mayer (1986) who maintain that as we enter our classes we should have two purposes: "...on teaching *what* to learn. ...on teaching *how* to learn (p.315)". Weinstein and Mayer's work is the basis for a Taxonomy of Teaching Learning Strategies. Teachers need to facilitate the "selection, acquisition, construction and integration" of information they present to students by considering rehearsal, elaboration and organizations strategies for basic and complex learning tasks; monitoring students' levels of comprehension; and, affective aspects by addressing how students may feel about what they are being asked to learn.

> Weinstein (1982) reports substantial gains in reading comprehension, academic performance and stress reduction for college students participating in an experimental undergraduate learning strategies course (p.324).

The concluding comments, from Weinstein and Mayer (1986), have been replicated many times in postsecondary, college and university settings. Professors responsible for graduate level statistics courses who had to compose with women who were avoiding signing up for courses; undergraduate students in Biology,

Sociology, Psychology, Education etc. who had potential but were not performing to criterion; at-risk elementary and high school students have all been reported in the literature as target groups who have benefitted from the acquisition of learning strategies.

The optimism we have implied in our discussion to help students should not be interpreted to mean that this is a "recipe" or a simple stimulus-response situation. Pintrich and Johnson (1990) have succinctly summarized this point:

> There is no one panacea or "magic bullet" to improve learning and motivation. It is only through the thoughtful adaptation of these ideas, models, and instruments to the individual faculty member's situation that we can improve students' learning of course content and about learning itself (p.90).

What we hope to have done is make explicit the "adaptation" Pintrich and Johnson refer to.

Chapter 4.

Theory-Into-Practice (TIP)

Form and content of teaching:

Recall the sudden spurt of energy that occurred as you read that this chapter would deal with "a case study". Perhaps you are one of those persons who skipped directly to this chapter. How is that? First, we expect that there will be no more theory. Our expectations for information processing are that material will vary from complex to simple and also difficult to easy to process. Students have the same experiences. When they enter courses for the first time even the simplest of theories and information is so new that it is foreign for many of them. Teachers need to tell them about what they may expect to learn, what it will do for them or to them, and prepare them for the fact that form and content affects what, how and when they will learn. This means that some of the information presented will be more difficult to acquire and process because it is complex. However, relatively simple cognitive tasks will be difficult to accomplish because the procedures and timing for doing them are critical.

An example, suitable for use in class, and for our own immediate needs, of this kind of form-content difficulty are the students who produce essays worth 5% and 25% of the final grade with just about the same cavalier attitude. Ask students how they expect teachers will respond to essays of 1)development, 2)identical length, 3)just about the same type and frequencies of misspelled words, grammatical mistakes etc., 4)of neatness and submitting it on time, etc. In this example we find the basis for introducing students to the necessities of developing, writing, setting aside, revising, editing and proof-reading for the major document while some development, writing and proof-reading, at a minimal level, for the essay with the lower weight.

The first issue resides in informing students about teacher expectations for what is to be learned, and how and when students are to manifest the intellectual abilities and skills to convince teachers that they have acquired the form and content of our courses. Teachers have to be careful in explaining about form

though. So many students, especially the ones prone to failure, are so grade-conscious that assignments take on an atmosphere like at a collective agreement bargaining table in which every comma and word take on particular meanings. The same also holds true for students who come in to bicker about grades. Teachers need to re-direct the conversation into how students monitor and use formative feedback and how they feel about doing poorly. The gist of the conversation is that the college years are a time of investment. That means that making mistakes are not only possible but quite likely. Feeling bad about making mistakes is normal. Determining where and how the mistake was made is learning "form". Then we can learn "content". Slow readers, or those who complain that the materials are "too long", or "too difficult", need to learn that looking up words, asking questions, and trying to determine where and when it is that the difficulties arise have set themselves up for change. Gains require moderate effort, realistic goals, a timetable, patience, and focusing on change rather than on "feeling bad". In the process of such conversations students discover the task-oriented support and caring environments that teachers can offer.

The Case of Chuck

Chuck, a 21 year old male student in the Commerce program, enroled in Psychology of Sexual Behavior. He came by the office to talk over his poor performance on the first two quizzes and the film report. He complained, politely, about the immense difficultly he was having in "getting by". He found the textbook difficult to read and very long.

> There may be some aspects of your student life which may help us place your current difficulties in context. May I ask you several questions to help us see through this situation? "Yes", he replied.
>
> "Do you have a part-time job?", "How many hours do you have to work?", "What about your involvement with sports and extra-curricular events, etc.?" We eliminated the possibility that too much involvement in work, sports or other school activities could explain not having the time to do the work and reading.
>
> We also eliminated some ethnic language background problem. "What language do you speak at home?", "What language do you consider to be

your mother tongue?" In spite of poor French language skills, and a Chinese language background at home, Chuck believed he was an English speaking person because that was the language in which he did his thinking. (In order to shape and encourage this kind of insight and reasoning) I mentioned that he showed some mastery of the form for thinking which we discussed in Memory, Thinking and Language in Introduction to Psychology.

"How are you doing in other courses?," I asked.

"In what courses do you think you do your best and worst work?", I continued.

I pointed out that it seemed to me that reading and writing, in general, seemed to be a problem. Performance seemed inversely proportional to the reading and writing demands made in the course. He didn't seem to understand the "inversely proportional" phrase. I picked up on this and asked him about it. He replied that he was not much good in math either. I asked him what he would ordinarily do upon leaving a teacher's office after hearing such a word or phrase. He didn't suggest anything that would lead him to ask about it or look it up. I decided to probe this a little more.

"What do you do when you run across a word in the course textbook for which you don't know the meaning?"

Chuck replied, "I expect to have some other words later that would tell me or suggest to me the meaning."

"How long have you been doing this?", I asked.

"As far back as I can remember," he explained.

It didn't seem realistic that a teacher had not picked up on this before. I decided that he probably was a little defensive on this point for now. I wanted to think through on how to avoid evaluation in this context. I decided I would return to it later, under other circumstances, and with better groundwork preparation.

Chuck is the most recent case on which I applied the theory we have seen on self-regulated academic achievement behaviors. His motives for taking the course,

besides being "interesting", was that he was near meeting graduation requirements and that he needed two courses to complete. He had taken four courses to avoid the penalty of tuition for taking only the two courses he needed. However, he did want to pass this course rather than taking an abandon on his transcript. I asked what "passing" meant to him. Chuck's goal was to get the mandatory 60% to pass. I agreed that I should like to work with him but that I felt we needed to make good use of our time. I explained this meant that we would set mutually agreed upon goals after narrowing in on what could be some problem areas. We would not tackle them all at the same time. Rather, we would try to eliminate major stumbling blocks. We agreed that he would do the work and I would provide the formative feedback. He would then be expected to re-do the work until he had made corrections to at least the major problems in his ways of doing his assigned work.

> What specifically", I asked "do you think is the major difficulty with doing poorly in this course?"
>
> "The multiple-choice questions", he replied firmly and non-hesitatingly.

We reviewed his previous two tests to see what we could learn from them. The preliminary analysis revealed that one difficulty was with vocabulary. I pointed out to him that his essay scores on the brief essays were much lower, relative to his multiple choice scores.

> "Would it not be much more worth your time to try to go from 3/20 and 5/20 to 12/20 on each of the essays from the previous two quizzes?" I asked.

He agreed but he repeated that he didn't understand what it was I wanted on the essays. "I know the material but I just can seem to get it out right," he added.

I asked him if he took lecture notes. Could he show me a recent sample? The material from a recent lecture was there, as I recalled, but it did require someone familiar with the lecture to decipher it. I asked him how he would use the information, pointing to several entries in his notes, to answer a brief essay question, as I was known to do on my quizzes. His reply went barely beyond what he had written. I asked several questions to probe what he remembered but not noted in his lecture notes. He managed to embellish his answer sufficiently well.

I pointed out to him that his written answer was worth 3/20; but, with the additional verbal material he had convinced me that a 10 or 12/20 would be in order. I asked what would have happened if he had taken the time to note down in writing these additional mental notes in his lecture notes.

We agreed that he should continue to take lecture notes but this time to monitor and evaluate them. That is, try to make a few embellishments and re-organize them as soon after the class as possible, and then come to show me them after the next class. I made an appointment then and there. He was worried about "it being worth it all". I asked him if he thought that the work was reasonable and attainable. "Sounds good to me!", he replied emphatically.

> "Can I still pass the course sir?" Chuck asked.
>
> I think so. You still have much work to do and that can average up your grade. By the way", I added, "when you don't know what a word means ask, or better yet, look it up. You'll find that as you do so your problems with vocabulary will decrease and then rate and efficiency of reading comprehension will improve."

So, I saw Chuck for another hour the week before Quiz 3. We checked his notes and I probed his memory again. He was invited to make additions on the spot. I also asked if he had some friends in class, to which he gave me several names. A quick check suggested that a few of these were "good" students. I asked if he felt at ease with asking one of them for some help. Compare, I suggested, the notes the friend took during lectures with the ones Chuck had taken and the ones he had just revised with me. How did the friend do it? After all, I talk "fast" for everyone listening. How do they manage to get more of what I say down on paper? Also, I mentioned that in the next meeting I would ask him to show me his lecture notes and then allow him to sit at a worktable in my office to peruse through my notes. I mentioned that the benefit of this exercise would depend on how well he could prepare for this activity by reviewing his own notes and checking with a few good students. The purpose was to show him that he could monitor his work himself. We agreed that there would be no benefit to just coming in and copying from my lecture notes what was missing in his lecture notes. We also reviewed the essay questions from the two previous quizzes to determine if vocabulary and directions were correctly processed.

I ask students to write their essay answers on the back side of the answer sheet used to record the multiple-choice and matching answers. I then grade them all face down to minimize any influence from knowing who wrote it. I explained this to Chuck and told him it had something to do with the "Halo Effect". He seemed genuinely interested in learning about how I monitored tests with item analyses, group performances with grade distributions etc. What interested him, I found out, was that I took the time to find out if the work I was giving students was "okay".

I decided to give him a practical example since he was so motivated. I asked him to complete the answer sheet, objective parts, for the next quiz. "Don't let the questions get in the way", I told him laughingly. Just place "X's" on one of the four letters for each of the questions. I then corrected it. I asked Chuck what were the chances of getting one correct answer given he had four to chose from. He quickly replied 1 in 4. So, I said that means that getting about 25% would mean that pure luck could explain the results, right? "Yes", he replied. I told him he had gotten 22% on the objective parts without even bothering to read the questions! What, I questioned, did that tell me when a student gets 30-35% on tests? Although he couldn't explain it to me in any mathematical sense, he did reason correctly that it didn't leave much proof that the student had learned much more than someone who guesses.

Chuck's scores on the essays improved gradually to the point where he earned 70% for the essay on the Final Exam. We also undertook, at his request, to examine the problem with slow reading and the multiple-choice questions. So, we reviewed the presentation made in one of the Introduction to Psychology textbooks (Bootzin, et al. 1991; p. 236)[4] dealing with the PQ4R method (Preview, Question, Read, Reflect, Recite and Review; Thomas and Robinson, 1972). We also examined the five basic multiple-choice type questions discussed by Vernon (1976;p.8) and the testing system, based on Bloom's Taxonomy of Educational Objectives, designed by John C. Ory (Dwyer, 1989) to measure factual, conceptual and application comprehension. Although he did improve his scores on the objective multiple-choice parts it was his performances on the matching (a simple vocabulary check actually) and the essays that got him through.

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[4]I intentionally use such materials because they are accurate and brief. I find many students have difficulty reading. Eventually they ask about following up on these materials because they now are convinced such materials (strategies) "work".

I don't doubt for a minute that Chuck worked not only "hard" but also "smarter". He earned a 64% on the Final Exam, and, when combined with the Quizzes (44%, 45%, 55%, 56% and 77%), plus going from 44% for his first film report to 70% for his second film report, he managed to earn 61% for the course.

A special note needs to be mentioned here. I am familiar, as most of you are as seasoned textbook readers, that anecdotes abound -especially as testimonials. I am sure that each of us could think up such an example and explain it quite differently. I chose the case of Chuck because he represented the most recent and typical student who comes in for help. I have had many such students, and I know my colleague in Psychology uses the same technique, although we convened earlier to refer to these interventions as "cognitive restructuring". We don't manage to get through to all students. What we have noticed is that we have curtailed substantially our abandons and failures. Since we have put this into place, amongst other things, students not only do better but we think it is due to the fact that they are actively involved ("self-regulated") in producing academic achievement rather than looking only to us for such an effect. When I look back at the time I used to invest for each student, especially those who came in to bicker about grades or to file emotional appeals for clemency, I find that I spend no more time now using this method to help students help themselves.

A case study is certainly insufficient for generalizability, and teacher expectancy effects cannot be reasonably ruled out. That is, the person doing the intervention in this case is the same preparing the tests, correcting and evaluating performances. There are too many intervening and antecedent variables to realistically expect that such an intervention caused the changes in Chuck's academic performance. After all, he too reported that he wished to avoid the stigma of an abandon or failure on his transcript. The case is used to support the argument advanced, and documented with references to expert sources and experimental results, that teachers can and should intervene. It is the nature of this intervention, teaching students learning strategies, *helping students overcome their self-serving attributional biases*, and competent teaching, that the author maintains is potentially useful to students for thinking about and dealing with problems related to student academic achievement motivation.

Chapter 5.

Discussion, suggestions for the future, and conclusions

Discussion:

The results of this qualitative survey reveal that teaching procedural knowledge (how to study) and conditional knowledge (when to study) promote students' self-regulated academic achievement behaviors. However, as we have discussed, teaching these learning strategies along with attributional retraining will most likely work only if they are added to the efforts of competent teachers with respect to declarative knowledge (course contents). We have focused on experimental studies, mostly with postsecondary, college, or university students, dealing with the variables of cognition, metacognitive processes, strategy learning and effort management. These were retained because the literature has convincingly shown them to interact with motivation.

A major drawback in our survey is the fundamental difference between our students, admitted on an open-door basis, and the population of students used in these studies. There is a considerable source of motivation from the fact that one has been admitted to a prestigious institution (for example, The University of Michigan); that one must avoid flunking out from a university in which an important, personal financial investment has been made (10,000$US is not unusual); and, that our Québec educational system differs in how students are taught at the preceding levels. For example, the curriculum for high school mathematics and English have been shown (Talbot, 1988) to be substantially different from those in the American high schools, as measured by the content analysis of the American College Testing program (a parallel to the Educational Testing Services' "Scholastic Aptitude Tests (SAT's)" which assesses high school achievement.

This survey, by its insistence on how students perceive attributional processes, focuses on qualitative research. A major obstacle in this perspective is that students may not easily involve themselves with the professor so that attributional retraining can take place. Some students' comments reveal that cognitive hopelessness and

learned helplessness have already settled in. Teachers must also remember that there is an illusory correlation between teachers' efforts and students' achievement. Teachers must get students to plan and participate in changing the way and time in which they do their work, *and learning how to perpetuate this process*. This report has identified and reviewed the literature to provide the teacher with the information and the means for accomplishing these goals.

Math anxious students, it has been argued, are a specialized case of the general failure of the students to acquire appropriate learning strategies combined with faulty attributional biases. So, while we reviewed this aspect we preferred to address the higher level of general strategy acquisition and attributional retraining from which such problems arise. We should expect that as more teachers practice these skills student failures and abandons would decrease.

Suggestions for future research:

Menec et al. (1992a; 1992b) has shown at the University of Manitoba that "it may be useful to consider attributional retraining as part of regular teaching activities". Menec, in experimental procedures, was able to show that "effective instruction," when combined with attributional retraining, enhances performances ---especially of the poor students.

Maureen Neuman at Cégep St-Lambert oversees the student peer-tutoring program to help their students in Chemistry, Mathematics, Accounting or Essay Writing. The emphasis of the tutoring program is neatly summarized in the title of the book they are using: "How to Study in College" (Walter Pauk; Houghton-Mifflin, 1989).

Denise Barbeau of Cégep Bois-de-Boulogne has received, exceptionally, a two year (1992-1994) PAREA[5] grant to: (elaborate and experiment on the diagnosis and intervention strategy for populations of students with learning difficulties)[6] .

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[5]Programme d'aide à la recherche sur l'enseignement et l'apprentissage du Ministère de l'Éducation du Québec.

[6] "..élaborer et expérimenter auprès d'une population d'élèves en difficultés d'apprentissage des outils diagnostiques et d'intervention".

Probably a time-lag design would do much to help us untangle some of the problems that plague this kind of research. For instance, if a very poor student enters the course and leaves much improved in his skills, but still fails, is it not worth knowing that the procedure was a success? If we only measure achievement by grades then we might overlook developmental aspects of the problem. Also, there is the additional problem that while motivation and cognitions change over time, and according to varying levels of interest and expected effort expenditure, the student's role vis-à-vis other students or teachers may be an important variable. Additionally there is the problem of withholding intervention strategy from some students who would have to comprise the control group. Finally, there is the slight possibility that who does the intervention and follows it up with the student may have an impact on the success of the intervention. We have suggested that perhaps the teacher's intervention and follow-up may be related to student attributional beliefs which are at the core of problem.

It would be possible to answer many of these questions with an obligatory course on work habits and intellectual skills and then to follow up on each cohort of students to examine performances, MSLQ and LASSI scores, and teacher self-reports of interventions. To maintain some control over the types and sequences of courses we would have to involve an entire Cégep in order to ensure valid and reliable answers to all these questions.

Conclusions:

One conclusion for this report is implicit to the literature and our discussion. Teachers, researchers, and whichever group has reported using interventions for learning strategies, have always implied that their own teaching motivation was enhanced. Perhaps it's just in cutting down on the bickering about grades. Then again, it may be perhaps because teachers and students relate more openly on the issue of learning and training rather than on testing and grades. The Hawthorn Effect (simply providing someone with social reinforcers, such as attention) may operate. Whatever it may be there hasn't been a single case reported in which the achievers were handicapped by such interventions, nor that teachers reported that the time invested was wasted.

Many of my colleagues expressed concern for what to expect from the Motivation Seminar; "Would I be talking about such and such particular aspect or student

problem?" Would we be dealing with real case studies? How much transfer could we expect between the Seminar and our daily teaching realities?" In brief, teachers have manifested the same concerns for attending and benefitting from the Seminar as most any of our students who register for our courses. If our own motivations and concerns are related to a Motivation Seminar, and we feel they are, then why should these concerns be any different for students and their courses. Are we not all looking for how to acquire this information, when and where to use it, what to expect, and what benefit to derive from trying it? Students that we were and teachers that we are, have not changed much in some respects. Why should student motivational processes be different from those of their teachers?

The report from the literature is clear: teaching students general and discipline specific strategies for learning enhances, through changes in cognitive, metacognitive and effort management, students' academic achievement. The literature reports also that many diverse groups of students benefitted when teachers and school boards implemented into the curriculum instruction in general strategy learning. We have argued and shown that including these changes probably takes no more time and effort on the part of the teachers than what they are currently investing.

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Appendix 1

"The Danger of Success in Math"[7]
by Earl Babbie

Since I began teaching research methods that include at least a small amount of statistics, I've been struck by the large number of students who report that they are "simply no good at math." Just as some people are reported to be inherently tone-deaf and others unable to learn foreign languages, about 90 percent of my college students seemed to suffer from congenital math deficiency syndrome (CMDS). Some of its common symptoms are frustration, boredom, and drowsiness. I'm delighted to report that I have finally uncovered a major cause of the disease and have brewed up a cure. In the event that you may be a sufferer, I'd like to share it with you before we delve into the statistics of social research.

You may be familiar with the story of Typhoid Mary, whose real name was Mary Mallon. Mary was a typhoid carrier who died in 1938 in New York. Before her death, she worked as a household cook, moving from household to household and causing ten outbreaks of typhoid fever. Over 50 people caught the disease from her, and 3 of them died. The congenital math deficiency syndrome has a similar cause. After an exhaustive search, I've discovered the culprit, whom I'll call Mathematical Marvin, though he has used countless aliases. If you suffer from CMDS, I suspect you've met him. Take a minute to recall your years in high school. Remember the person your teachers and your classmates regarded as a "mathematical genius." Getting A's in all the math classes was only part of it; often the math genius seemed to know math better than the teachers.

Now that you have that math genius in mind, let me ask you a few questions. First, what was the person's sex? I'd guess he was probably male. Most of the students I've asked in class report that. But let's consider some other characteristics:

1. How athletic was he?
2. Did he wear glasses?
3. How many parties did he get invited to during high school?

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[7]Babbie,E. (1989) **The Practice of Social Research** 5th ed., Belmont,California: Wadsworth, pp.436-437.

4. If he was invited to parties did anyone ever talk to him?
5. How often did you find yourself envying the math genius, wishing you could trade places with him?

I've been asking students (including some adult classes) these guestions for several years, and the answers I've gotten are amazing. Marvin is usually unathletic, often either very skinny or overweight. He usually wears glasses, and he seems otherwise rather delicate. During his high school years, he was invited to an average of (mean) 1.2 parties, and nobody talked to him. His complexion was terrible. Almost nobody ever wanted to change places with him; he was a social misfit, more to be pitied than envied.

Here's the point of my report on Mathematical Marvin. As I've discussed Marvin with my students, it has become, increasingly clear that most of them have formed a subconscious association between mathematical proficiency and Marvin's unenviable characteristics. Most have concluded that doing well in math and statistics would turn them into social misfits, and they have regarded that as too high a price to pay.

So if you are one of those people who is "just no good at math," it's possible you are carrying around a hidden fear that your face will break out in pimples if you do well in statistics in this course. If so, you're going to be reading the rest of this chapter in a terrible state: wanting to understand it at least until the next exam and, at the same time, worrying that you may understand it too well and lose all your friends.

Before exposing you to any numbers,then, I want to assure you that the level of statistics contained in the rest of this chapter has been proven safe for humans. There has not been a single documented case of pimples connected to understanding lambda, gamma, chi square, or any of the other statistics discussed in the pages to follow. In fact, this level of exposure has been found to be beneficial to young social researchers.

By the way, uncovering Marvin can clear up a lot of mysteries. It did for me. (In my high school class, he didn't wear glasses, but he squinted a lot.) In the first research methods book I wrote, I presented three statistical computations and got one of them wrong. In the first edition of this book, I got a different one wrong. Most embarrassing of all, however, the first printing of the earlier book had a

unique feature. I thought it would be fun to write a computer program to generate my own table of random numbers rather than reprinting one that someone else had created. In doing that, I had the dubious honor of publishing the world's first table of random numbers that didn't have any nines! It was not until I tracked Marvin down that I discovered the source of my problems, and statistics has been much more fun (and trouble-free) ever since. So enjoy.

Appendix 2

Seminar Presentation

Transparency Masters

TRANSPARENCY 1

1- AcademicTASKS

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1. Academic TASKS require students to process visual-written, oral-auditory, kinesthetic, and sometimes olfactory-gustatory information.

1.1 Visual-Written

1.11 Reading textbooks, notes on the blackboard, handouts, one's lecture notes, etc.

1.12 Copying, annotating, writing essays, book, film and other types of reports, or otherwise marking and writing comments

1.13 Attending to visual information such as gathered on field trips, visits, guided tours etc.

1.2 Oral-Auditory

1.21 Listening to lectures, radio, audiotapes etc

1.22 Preparing oral examinations, participation in discussions, seminars, book or film reports, audiotapes etc.

continued...

1.3 Kinesthetic

1.31 Biological and physiological considerations

1) extended periods of sitting

2) all types of physical handicaps and limitations (the very tall or short people for example, rarely feel comfortable in the seating arrangements provided in lecture halls)

3) Trying to study, read etc. while hungry or having eaten too much etc.

1.32 Psychological processes (Environmental Psychology)

1) prolonged attention spans against the need for novelty and variety to maintain attention

2) forced proximity interacts differently with individuals as a function of the introversion-extraversion personality dimension of the individual and personal space beliefs.

1.4 Olfactory and Gustatory: Specialized courses, mostly in Pure and Applied and Health Sciences, require students to learn such discriminations.

TRANSPARENCY 2

2 - STRATEGY USE

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2. STRATEGY USE (Adapted from Pintrich, 1988b, p.71)

2.1 Knowing about strategies
- 2.11 Rehearsal
- 2.12 Elaboration
- 2.13 Organization

2.2 Knowing "how to" (procedural knowledge)

2.11 Rehearsal
1) reading text in advance of lectures
2) listening to lectures
3) writing down in note form
4) talking with other students about what they heard, remembered, understood and noted

2.12 Elaboration
1) editing lecture notes
2) comparing material underlined in text with lecture notes
3) summarizing and paraphrasing what one has read, heard, noted down or talked about
4) application or generalization of materials to real world events and problems

continued...

2.13 Organization

1) Diagrams, tables, and figures
2) Charts and graphs
3) Themes and outlines

2.3 Knowing "when to" (conditional knowledge)

2.31 Time
2.32 Place
2.33 Reinforcement-affect and state dependent memory
2.34 Work or study groups, tutoring

TRANSPARENCY 3

3 -PERFORMANCES

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3. PERFORMANCES (Academic achievement)

3.1 Success versus Failure

3.11 "Open-door" admissions' policies imply that students will be given every chance to attain their potential as quickly and efficiently as possible.

3.12 Mastery and competency-based learning, when they strive towards a normative criterion of achievement, may not be in keeping with the negative self-attributions of ego-oriented students.

3.2 A developmental perspective

3.21 The progress a student makes is an important motivational element in the developmental perspective of "achievement."

3.22 Teaching students learning strategies, it appears, meets the requirements of developmental education and, providing there is a minimal level of potential to develop, may actually move students towards performing to criterion.

TRANSPARENCY 4

4 - FEEDBACK

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4. FEEDBACK

4.1 Types of
- 4.11 Summative
- 4.12 Normative
- 4.13 Formative

4.2 Responses to type of feedback by task-oriented versus ego-oriented students (Talbot, 1990)

4.21 Task-oriented
1) monitor and use formative feedback
2) are influenced by IM or IM and EM (discussed below under item 6.3)
3) have higher levels of need for cognitive structure
4) tend to have large and discriminating attributional processes

Continued...

4.22 Ego-oriented

1) report monitoring and using formative feedback but actually are observed to rely on summative and normative feedback
2) are influenced more by high EM and low IM (see item 6.3 below)
3) have moderate levels of need for cognitive structure
4) tend to have simple attributional processes characterized by simple dichotimistic thinking

4.3 Learning history

4.31 Family background

4.32 Sociocultural context

TRANSPARENCY 5

5- SELF-KNOWLEDGE

(cf: Markus, Cross and Wurf, 1990)

5. SELF-KNOWLEDGE
   - 5.1 "I am able"
   - 5.2 "Possible selves"
   ("Hoped for self" vs "feared self")

TRANSPARENCY 6

6 - PERSONAL/MOTIVATIONAL STATES

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6. PERSONAL/MOTIVATIONAL STATES
(Adapted from Pintrich & Garcia, 1991)

6.1 Ego-Oriented or Performance-Oriented Self-Attritutions

6.11 "I musn't be that smart to have to work so hard"
6.12 "I must really be stupid to have to work this hard"
6.13 "Intelligence is fixed at birth"
6.14 "You've got it, or you don't!"

6.2 Task-Oriented Self-Attributions

6.21 "Where did I go wrong?"
6.22 "I must have missed something in the directions, or the facts given in the work to be done. I'd better find out where and how I made this mistake."
6.23 "Intelligence is a product of potential and environment!"
6.24 "Somebody should be able to explain this to me. It's got to sink in eventually!"

Continued...

6.3 Intrinsic versus Extrinsic Motivations

6.31 IM high for mastery learning & EM low for grades produces the highest performances

6.32 IM high for mastery learning & EM high for grades likely to lead to high performances but accompanied with anxiety about performances

6.33 IM low for mastery learning & EM high produces students who will be dependent on strategies or testwiseness and other "tricks" to pass the course.

6.4 Self-Efficacy Beliefs

6.41 Outcomes are a result of ability (ego-oriented) or of effort dictated by strategies (task-oriented)

6.42 Outcomes that don't match expectations are a reflection on my lack of ability (ego-oriented) or they are a reflection that I need to learn or modify a strategy (task-oriented)

TRANSPARENCY 7

7 - METACOGNITIVE PROCESSES

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7. METACOGNITIVE PROCESSES (Pintrich, 1988b)

7.1 Planning
- 7.11 Survey
- 7.12 Question
- 7.13 Set realistic reading goals

7.2 Monitoring
- 7.21 Use table of contents or detailed chapter outline as a guide to help you review.
- 7.22 Use student workbook or similar study guides to read summaries and take self-tests under realistic conditions (no peeking or correcting until the whole test is finished!)
- 7.23 Compare lecture notes with textbook materials.

7.3 Regulating
- 7.31 Reading comprehension and rate
- 7.32 Reflect on what you read
- 7.33 Review, in small sections, what you read

TRANSPARENCY 8

8 - SPECIFIC STRATEGY KNOWLEDGE

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8. SPECIFIC STRATEGY KNOWLEDGE

8.1 How are strategies for learning similar /or different in this course than for other courses or subjects?
8.11 What are we expected to memorize / recognize?
8.12 What are we expected to understand / recall?
8.13 How important is it to understand and follow the procedures and timetable given for doing the work?
8.14 Provide one example in which the content, procedures and timing of the work by students led to a high, middle or low grade

8.2 Show your awareness of the "shortcuts" students think they can "get away with" and why these lead to lowered self-esteem and poorer performances.

8.3 Explain how the use of time, effort management and seeking help can help students accomplish 8.1 and 8.2